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A MANUAL
OF
PHILOSOPHY

FIRST VOLUME

I. Cosmology

II. Philosophical Psychology

Translated by

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A LETTER - PREFACE

Dear Father Munier :

After finishing the reading of your manual of philosophy I cannot help but be filled with feelings of regret and envy.

Of regret, when I think of the time — years ago — when I preceded you in the chair of philosophy at the Diocesan Seminary of Nancy at Bosserville. If I only had your manual then ! But no, in the manuals which were available to a novice philosopher at the time, I straggled with formulas, which were either excessively simple, or practically unintelligible to the student. It seems to me that if your forthright and profound expositions were at hand, I could have much more easily opened up the minds of my pupils to the mysteries of philosophy.

Of envy — yes, in retrospect I envy your pupils for having such a master to give them his thoughts in these pages, wherein clarity and profundity go together. Fortunate pupils ! Do they know all they owe you for an intellectual formation which will bring so much benefit to their theological knowledge? I am not sure that they do ; but my duty is to tell them.

Shall I speak first of the doctrine which is at the base of your teaching? It gives one an impression of security. Here is an authentic Thomism, that is to say, a traditional Thomism, but re-thought in relation to modern philosophy. It abandons nothing of its essential positions, but illumines them with the advance of science and contemporary thought. It is a Thomism which is definitely not a mere accomodation to the taste of the times, as are some “ concordist ” types of neo-Thomism, yet it makes no pleas for the old or the outmoded. The secret of this security is that you have deliberately penetrated the Thomist philosophy “ from within ” instead of expounding it “ from outside,” as a mere linking of already fashioned formulas. We find ourselves before a system of thought, master of itself, which dominates the different branches of philosophy.

Everything is considered through its inner nature. It is properly speaking a philosophy wherein the light of Thomistic principles is cast progressively on all the problems treated.

I deliberately say : progressively. For from cosmology to theodicy and ontology, there is a definite march of thought, wherein from truths already acquired each step leads to a new truth. Must we speak of a philosophical synthesis? Yes, if by it we mean that, through a detailed and correct analysis, you arrive at a well-balanced, rational construction which satisfies the mind. This is certainly your aim. For you it is not enough simply to gather together the principle Thomistic theses in an artificial whole. You are concerned with unity, and you wish to show there is a continuity of thought from one treatise to another. The same principles are found throughout. Solutions of problems are mentioned, compared with each other, coordinated, and finally composed into an organic whole.

This impression of security and this effort at unity come principally from your method. It seems to me that it is inspired by three major concerns.

Foreseeing the difficulties which young minds experience with abstract truths, you take care to go from the known to the unknown. You begin with immediate experience, with the data of common sense, with elementary observations which every man makes in the course of daily life. Then you make precise statements in the light of scientific results furnished us today. Nothing is better suited to accustom the modern mind, eager for facts and concrete experience, to elevate itself little by little to more subtle considerations. It is thus that, transcending the sensible world, you arrive at the intellectual.

The progress of pure thought must take into consideration the often divergent paths which the philosophers of all times have taken. That is why you follow patiently, one by one, the avenues which they have opened before you, but if they lead to an impasse, you close them. You do not study other philosophies for themselves, as a historian; you show the point at which they insert themselves; you discuss them briefly with

firmness and accuracy; and you bring the mind back to the exact starting point from which it must begin its journey to avoid the pitfalls of bias. This is not to say you discount the good and the new which the human mind has been able to produce since the time of St. Thomas. Certainly not! On the contrary, you are only too happy to underline whatever is valuable in the other different philosophies. In other words, you try to incorporate into the *-philosophia perennis* all that has enriched thought throughout the course of time.

Finally, your method is characterized by that sense of analysis, which, after having posed a problem, systematically studies it in all its aspects, with a "professional conscience." Certain people may find the latter too meticulous, but its demands cannot be ignored if you are to remain faithful to the exigencies of thought. Analysis does not mean here a dispersion of the mind in all possible directions. There is no fecund analysis, except that which is directed toward synthesis. The whole art of the scientist and of the philosopher is to conduct his research in such a way that an objective study of the facts is broken down into the elements of a coherent synthesis. One senses at each moment that this effort is the driving force behind your demonstrations. The theses with which you begin your chapters are not *a priori* scaffoldings, which must be explained in a deductive manner. They are rather an anticipatory résumé, which serve as a guide in the rational search for a solution to the stated problem.

This research may seem dry to superficial minds. Yet whatever dryness is there, it is tempered by the elegant sobriety of your style. Without wishing to involve myself in a literary criticism, permit me to compliment you on your unequivocal style. Exactness of form, preciseness of expression, clarity of exposition, firmness of development; here are qualities to which we cannot be insensible. Whether we will or no, we must follow you. And we do follow you. Scarcely have we interiorly formulated an objection, when, seeming to sense it, you surprise us by foreseeing our criticism and answering it with an imperturbable serenity. How have you managed, in such

difficult matters, to give the impression of ease with which you move among these thorny problems? At certain times you address your reader directly, and if I dare say so, even take his part in order to convince him. A tiny sally of humor here or there, a picturesque detail, relax the mind. These are brief respites in the middle of a rough climb. This gives your book a *human* touch, which from the first evokes the good will of the reader.

Shall I point out the views in your work which seem to me most felicitous? That would perhaps be too long a task. However, here are some reflections which arose in the course of my reading.

1. *cosmology* reveals an author whose philosophical formation is paralleled by a scientific one. We feel that you are familiar with the laboratory, and through certain precise statements in biology, we recognize the disciple of Professor Cuénot. This has enabled you to leap over certain objections which have been put out of circulation by the progress of science. It has also permitted you to show how hylomorphism, far from being opposed to scientific data, can be included in the ideas to which a man of science is able to subscribe without disavowing his scientific position.

By pointing up the originality of life, you have proven the irreducibility of life to matter in a positive manner, for which I congratulate you. As you happily stated : " A living thing is an individual endowed with immanent finality. That which distinguishes it from the non-living is neither individuality nor a finality in general, but the immanence of that finality, which directs its action to the transformation of the individual. "

I expected a lengthier development on the problem of evolution, but undoubtedly it seemed to you that here was a case of a scientific hypothesis, whose value was to be verified rather by the scientist than by the philosopher, who had nothing to criticize, if the work of Providence linking cause to effect was safeguarded. You have, however, taken up the question of the origin of man in philosophical psychology. Your very objective analysis of transformism leads you to affirm : " The only sufficient

cause of such an evolution can be God alone, the free author of nature and the creator of the human soul. ”

2. You begin philosophical psychology, as one would expect, by the study of psychological phenomena. Your development supposes a knowledge of the facts themselves as they are presented by scientific or experimental psychology. Thus, you are no longer concerned with describing facts, but with explaining them. You analyze psychological becoming with virtuosity; and in encountering Bergson, you concede to him what is valuable in his acute observations on the flow of duration. Yet in doing this, you insist on the proper character of psychological phenomena, as to their individual and specific distinction in the unity of the " ego. " The unity of the " ego " is not therefore an absolute unity; it is a unity in the movement of phenomena, the unity of their succession, their continuity and their direction.

I assure you that I was especially interested in your explanation of the process of knowledge in which you unravel this mysterious mechanism in the clearest manner possible, from the *species impressa* — to use the scholastic terminology — through the intervention of the agent intellect, to the *species expressa*, or idea.

As to the destiny of man, you have evidenced a healthy optimism, which gives confidence to the man who recognizes his dignity as a person en route to his final end, which is union with God by a perfect affective and contemplative knowledge. The way is open to what Revelation will offer as a means of leading man to happiness in the intuitive vision of God. This hope is much more comforting than the philosophy of Sartre, which drives man to assert the absurdity of his own existence, the impossibility of freely justifying his liberty, and the impossibility of reaching God.

3. Undoubtedly, the part of this manual which will be most appreciated by professors of philosophy will be theodicy, or Natural Theology. It is developed with perfect clarity, according to a classic plan. We can only admire the rigor with which the arguments are presented, a rigor which even

risks being a bit stifling for beginners in philosophy, pressed as they are on every side by the logic of your reasoning. Through your analysis of the transcendental value of causality, you have refuted, one by one, with unflagging patience, all possible objections against the knowability of God. As for the "five ways" which, according to the Thomistic dialectic, lead to God, they are carefully "husked" so that they are exactly understood before being justified. You were right to insist on human values as the starting point for a rational justification of the existence of God, for these values are more than ever the order of the day, and modern minds grasp them spontaneously. The danger lies in building a sentimental argument on this starting point. You have, however, avoided this by giving your demonstrations a form precise enough to remove the confusing characteristics over which these kinds of proof often stumble.

The dispassionate yet very clear expositions which you have made on the controversies in which theologians have involved themselves on many questions (divine concursus, predestination, the relation between human liberty and divine knowledge), will be useful to future theologians as a help in approaching discussions wherein they would risk being led astray. The light thus thrown on the field of moral science and theology gives your theodicy a savor of the practical. One has the feeling that such a sure, well balanced doctrine, can have excellent results in a man's spiritual life.

4. You have courageously attacked the problems of the critique of knowledge, where the minds of philosophers so often founder. Beginning with the fundamental problem, you have sidestepped skepticism and idealism by stating as a fact that there is in us a power of intuition capable of grasping the very being of things. Then you endeavor to discover the different kinds of intuition realized in us, by noting the decisive value of the principal modes of knowledge placed at our disposal. This laborious inquiry is directed with care. It is not lost in details, once the foundations of knowledge are laid. We would have liked a little more development on the first principles of knowledge and induction, but undoubtedly you decided that

the notions of identity, unity and causality are better treated in ontology, and that the study of induction belongs rather to the methodology of the sciences.

5. Certain people will be astonished that your ontology is presented at the end of the manual. You have justified yourself in explaining why. Reflecting on it I can only say that your decision is a God-send. In any case, the students will be happy about it. Placed at the beginning of metaphysics, ontology disheartens them. Placed at the end, they will understand the meaning and the import of it. Having, I dare say, "manipulated" the ideas of being, unity, causality and finality in regard to real and concrete beings all along their philosophical formation, they will be ready to understand them in that degree of abstraction which ontology demands. They will even take a liking to this study, which will come to them as a synthesis, wherein the applications drawn from psychology, cosmology and natural theology will have their rational justification. Having climbed the principal stages of the hierarchy of being, one can succeed, as you say, "in interesting young minds in metaphysical notions and principles, and in making students understand them, precisely because of their role in unraveling the problems of the world, man and God."

We are not saying that your manual is perfect. *Can* a manual be perfect? Objections will be made and undoubtedly you will be able to answer them.

a. It may be said for example : "This manual is too long, too complicated for neophytes in philosophy." And with their expressive mimicry, and with an apprehensive look, the students will begin to weigh the book in their hands. There are two possible conceptions of a manual : the manual which the professor summarizes, and the manual which the professor develops. You have chosen the former. That is your right. You have seen that in attempting to summarize arguments or discussions, one runs the risk of mutilating them and of taking away from them all scientific precision. Passing out the truth in tablet form is most often adulterating it. It is my opinion that you have done a great service to students whose written notes are

generally confusing because of their inexactitude, and a greater service to professors to whom you offer serious matter for reflection.

b. Perhaps certain people will object : " Some chapters are arduous and too difficult for students. " I agree that philosophy is difficult. And what is anyone able to do about that? A philosophical work cannot be read like a magazine or a detective story. It is the function of the professor to help the student by familiarizing him with philosophical notions. If the manual is sufficient, of what use is the professor?

c. Others will reproach you with not having written your manual in Latin which is the language of the Church. Evidently you have given the matter considerable thought. But your thirty years of teaching have undoubtedly convinced you, that philosophy is difficult enough for the average student without adding the difficulty of Latin. You could have, as many authors have done, presented the exposition of the proofs in Latin, and explanations in the vernacular. You have preferred to reserve the Latin for texts cited from St. Thomas. It was perhaps the best way to make the nuances of your thought attainable to the students for whom Latin remains very much a mystery. However, it would seem commendable for a professor to furnish the student with a résumé in Latin, or ask him to make one himself after the explanation in class.

d. But I am coming to a criticism which seems much more serious to me. I heard of a professor who had a copy of your course in mimeographed notes, who seemed to think that you explained Thomism as a closed system, sufficient in itself, making it difficult to see how it developed, how it was shaped by previous philosophies, or how it was able to serve as a basis for further progress. Briefly, your conception of philosophy appeared to him a little static. A number of philosophers prefer a more historical conception, in which we see the problems appear in their proper times, and in which the solutions are revealed by successive approximations and oppositions. I am convinced that this historical conception of philosophy, which

is not to be confounded with a history of philosophical systems, has a certain advantage in bringing out what St. Thomas borrowed from the ancients, what was original with him, and what he left succeeding ages to discover. But is this method appropriate to a manual? I doubt it. If one has no fixed point of reference to which to attach oneself, I fear that in following the movement of history, one drifts with the current not knowing where one is going.

e. I will not quibble with you over certain details upon which you have taken a stand, concerning which your readers will not always have the same certitude. I would have liked to have seen you give a greater part of your work to the explanation of certain philosophical tendencies, whose influence is being felt by modern youth. I am thinking of the personalism of E. Mounier, or the philosophical thought of Gabriel Marcel. You might answer me that a manual is not meant to be an up-to-the-minute book, and one is not able to parade in it all of the current philosophical "stars." I agree. But since you have felt it necessary to make a copious analysis of Marxism and existentialism (or rather Sartreanism), would there not be a way to allude to other systems of thought which the students may perhaps have already encountered in life? You will without doubt answer that you seek to form rather than inform, and that, facing a choice, you would prefer to give information largely on what is most important in contemporary thought, and on what is most lasting and most dangerous in its aggressiveness, rather than criticize those systems, which, despite their numerous deficiencies, are not hostile to Christian philosophy.

As it is, your manual certainly merits the widest appreciation by professors and students. I wish it every success. It will contribute to the solid formation of minds in the traditional philosophy of the Church. In the name of your future disciples, I thank you.

Will this preface be like many other prefaces — not read? Perhaps. But the reader who will have the patience to glance through it will know that in studying your book he will be

assured of finding an intellectual enrichment, and an experience well worth the effort, namely, " the joy of knowing. "

Dear Father Munier, be assured of my affectionate devotion in our Lord.

t Louis-Marie de Bazelaire
Archbishop of Chambéry
Chambéry, June 14, 1956

TRANSLATOR'S PREFACE

Although the merit of philosophical manuals, especially those in the vernacular, may be highly debatable these days, nevertheless the translation of Father Munier's manual of philosophy was undertaken with the profound conviction that it might well serve as a model to teachers of contemporary Thomism in this country. The translator has long felt that many of our English text books in philosophy present Thomism as a whole sufficient unto itself without adequate consideration of its confrontation to and by contemporary philosophy. It is the particular merit of this manual that it presents Thomistic principles in a context which shows acute awareness of the exigencies of contemporary thought. Although this book was written primarily for seminarians, it is hoped that it will be found useful in the regular collegiate undergraduate courses in philosophy as well.

I must acknowledge my debt of gratitude to Dr. Roland Houde, without whose encouragement I would not have undertaken this task. For their help and advice in the preparation of this translation I thank my confreres, Rev. Thomas V. Cahill, C.M., S.T.D., and Rev. George C. Tolman, C.M., S.T.D. I am grateful also for the technical assistance of Miss Jessie Grecnsley and Mrs. Virginia Bogren.

T.W.C., C.M.

I

COSMOLOGY

INTRODUCTION

1. Notions. Cosmology is the metaphysical study of the world or of the corporeal universe. This world is first known *empirically*. It is then studied methodically by the experimental sciences. Physics, chemistry, cosmography, astronomy and geology have for their object the material universe; biology botany, zoology and paleontology have for their object the world of living things. Their task is to discover the laws of phenomena and to explain them by deducing them from spatial and temporal dimensions (structures and movements); this process is already very much advanced in regard to matter, but it has scarcely been broached and is perhaps impossible in regard to life.

The sciences, however, do not settle all cosmic problems. Even if we were to suppose that science had exhausted all of its problems, two problems, both of them philosophical, would remain. The first would be an *epistemological* one : what is the validity of science? At what level does it grasp the real? Specifically, how is it able to guarantee an agreement between the things it studies and the fundamental notions which it implies? What reality is designated by the concept of mass, that of pressure, that of law? There are other grave critical problems related to this epistemological one, such as the moral

* This study has as its " material " object the extended, moving and sensible world. Its " formal " object is the world's manner of reflecting existence, or how the world is understood as it is brought under the absolute principles which are true for all being, in a word, its ultra-experimental or metaphysical character. Thus, cosmology considers mobile being under its ontological aspect. Its " physical " object, although experimental, is considered by an attention, which concerns itself with an aspect of the world which is completely metaphysical. See Jacques Maritain, *The Philosophy of Nature* (New York : Philosophical Library, 1951). pp. 118-156; Désiré Nys, *Cosmologie* (Louvain : Institut Supérieur de Philosophie, 1903). Vol. I, pp. 26-40.

and aesthetic value of science, its civilizing value and its human value. The second problem, which is ours, is *metaphysical*: what is the world in so far as it is being, and what are the causes of its being? Science sees only phenomena in the world, and it has studied only their spatial and temporal determinations. Cosmology sees in the world a plurality of existences, separated into specifically distinct essences, and an incessant becoming linking an existence which disappears to another which begins. What it is interested in is the existence of the world and its causes. This specifically metaphysical interest makes of cosmology a "science" § specifically metaphysical.

2. Distinct from the experimental sciences, because it directs its attention towards the existence of material being and not toward its spatial-temporal dimensions, cosmology is also distinct from other metaphysical disciplines: *from psychology*, because it does not concern itself with a microcosm which forms conscious realities; *from ontology*, which sees the world under the aspect of being in general, whereas cosmology considers the world under its distinctive characteristics which are strictly corporeal; and finally, *from theodicy*, which treats of God as the object of its study, while this science attains Him only under the aspect of the First Cause of this corporeal world which is its only object. Cosmology and psychology taken together constitute the philosophy of nature.

3. The method of cosmology is the metaphysical method. It is first of all, as every other method, scientific, seeking that which is stable in the midst of the transitory characteristics of things, a process of the mind going from the accidental to the essential. But it is above all a passage, rationally necessary, from the experimental (phenomena), to the extra-experimental or intelligible reality, without which this datum would be incom-

* A science in the sense of Aristotle and the Scholastics, "Certa rei notitia per causas" (a certain knowledge of a thing through its causes), cosmology is not a science in the common usage of that term, nor is it a résumé of the sciences of nature, nor even a philosophy of the sciences. Since the time of Kant and Comte, common usage has seen in the word science a knowledge of phenomenal laws and not a search for their ontological causes.

prehensible (This datum, on the one hand, exists. On the other hand, it does not have *of itself what is necessary for existence*).

The starting point of such a method, in the facts properly-stated and analyzed to this end, is the intellectual understanding of an aspect of being which manifests a certain insufficiency for being. It has as its driving force the principle of sufficient reason : " No being exists which is insufficient for being " or, " Every being has sufficient reason for being. " Finally, the end of the research is an affirmation which bears on the *make-up* of the being studied, on its productive *cause*, on the *orientation* of its activity and passivity, in a word, on everything which assures to the being concerned that sufficient reason of which it seemed deprived in our initial analysis.⁸

Thus the analysis of change led Parmenides to state that becoming was unintelligible; but Aristotle, convinced that movement had its reasons, came to this conclusion : the mobile object is constituted in such a way that it is able to be other than it is; it is therefore composed of matter and form. Thus a body is defined as being by nature a composed substance; it is also characterized as caused, as subject to laws.

4. The human importance of cosmology is measured : (1) by its *dignity* among the sciences : the scope of its object (the whole universe), and above all the direction which its attention takes toward the intimate core of things (their essence), establish it as the queen of the experimental sciences; (2) by its *services*: for the scientist it removes the limits which his own method imposes upon him, and opens up perspectives beyond science; 4 for the psychologist it furnishes the frame of reference wherein human thought can be inserted through the hylomorphic theory, wherein an intelligent soul finds a place already prepared for it; for the theologian it opens a way which leads to God, Creator and Regulator;⁸ finally, for the believer who hopes to understand.

» Sec Louis De Raeymaekker, *Philosophy of Being* (Saint-Louis : B. Herder, 1954), pp. 75-78; Charles A. Hart, *Thomistic Metaphysics : An Inquiry into the Acts of Existing* (New York : Prentice-Hall, 1958).

† Sec J. Marttain, *The Philosophy of Nature*, pp. 122-123.

• Sec J. Marttain, *ibid.*, pp. 129-130.

it formulates an analysis of extension, of place, of natural laws, etc., with which the mystery of the Eucharist, the reality and the nature of miracles, etc., have evident relations.

5. Let us divide our study according to the exigencies of the method of discovery. Going from the simple to the complex, let us first study individuals which form this world, reserving a special part for life because of its originality; then let us examine the two aspects of the universe, which language, the expression of common experience, distinguishes.

Book One : Bodies in General or Matter.

Book Two : Corporeal Living Things or Life.

Book Three : The World.

Book Four : Nature.

BOOK ONE
BODIES IN GENERAL : MATTER

The world is formed of *bodies*. Empirically, a body is an object possessing volume which we perceive and mark off by reason of tactile and visual sensations. Scientifically, a body is a spatial dimension, able to be conceived through relations to certain other bodies, and indicated through the medium of instruments which amplify and make precise the import of our senses. There are other things which science regards as bodies which are not in accord with the aforementioned description, such as subatomic particles, the atom itself and light particles. The philosopher ought to have a notion of body flexible enough for it to be applied, if necessary, to objects as far removed from sensation as the proton and the electron. However, it should be precise enough to permit him to grasp in his study, without any possible confusion, all of corporeal reality, and it alone. Now, the language of the scientist, conforming to the language of the "average man," designates as bodies those realities which have as their constant attributes extension, qualitative determination and movement. It is this with which the scientist is concerned. We must search for *that which in itself is* the reality which possesses these attributes and which is called a body.

We must first analyze these corporeal attributes (Chapter I). Then only will we be able to define the essence of a body and determine its cause (Chapter II). This method is imposed on us by the very nature of our mind. It proceeds by abstraction, which can attain the essence of a thing only by reflecting on the multiple aspects furnished us about the object through the analysis of sensory data. To reach the essence is to know the intimate core wherein these multiple aspects are unified.

CHAPTER I
THE ATTRIBUTES OF BODIES

First Question : What is *extension* or corporeal quantity?

First Thesis : Corporeal quantity is :

1. *essentially continuous*;
2. *múltiplo*, with a *potential*' multitude of parts;
3. *essentially divisible into infinity*;
4. *finite* with real limits.

A. Notion

1. *Empirically*, extension is a sensory datum common to all tactile and visual sensations.

2. *Scientifically*, in Euclidian geometry at least, abstract space, homogeneous and infinite according to three dimensions, represents a notion separated from all the determinations in which common sense is especially interested : it is the stuff of all lines (one dimension), of all surfaces (two dimensions), of all solids (three dimensions); it is furthermore the bearer of all possible movements. Its principal property is divisibility which gives it its aptitude to be measured, that is, to be related to one of its parts taken as a unit and expressed by a number. ' From this point of view, a body is a section of space limited by surfaces, limited by lines which, in tum, are limited by points.

• *Numerus* est multitudo mensurata per unum. St. Tb., !• pars, <1- 7. a. 4.

This notion of quantity develops in two opposing senses. The sciences of nature, which are interested in discovering the structures of bodies, use this scientific idea of extension, but they *make it concrete* by determining it in a qualitative way. Thus an electric field is an extension endowed with certain properties of attraction and repulsion. However, mathematics, the science of measures in general, through an increasing abstraction gives the notion of extension a wider sense. Here it becomes synonymous with the measurable. Thus, space, so generalized, now becomes a magnitude having n dimensions, implying n independent variables. Now it so happens that the physicist uses the language of mathematics and employs its method when he speaks of the quantity of heat, of electricity... Let us leave these notions for a while, the one which mixes quantity with extension, the other which deprives extension of its corporeal mark, the exteriority of parts. Let us analyze the notion of extension in its purity.

3. *Philosophically*, corporeal quantity is that which gives to bodies parts which are simultaneously external to each other. It is distinct from temporal duration, whose parts are successive, and from number, which is a measure whose parts or units coexist in a whole, but are not distinct by a relationship of exteriority.

Corporeal quantity is conceived, as is duration, under two forms : continuous, if the parts are not distinct one from the other by limits which are proper to each one of them, but held together by a limit common to all of them; discontinuous, if each of the parts possesses its proper limits. So parts are either contiguous, if their surface limits touch each other at some point, or distant, if they do not. Thus for the eye, the page from a notebook is continuous, and two pages placed together are contiguous. The parts of a continuum become contiguous and even distant because of division.¹ Analogically,

* *Division* can be achieved by a real separation (i). or as simply thought, and in this case it can be done in a completely precise way (2) or in a more or less indetermined way (3). Examples : I distinguish the top of this tree from its base (3) ; I think of the right side and the left side of tills rectangle (2), I mark them oil with a pencil (2) or I separate them effectively (1).

undivided numerical unity is said to be continuous, and number is a total of discontinuous units in relation one to the other.

We must seek which of these three forms is fundamental in order to define extension in its essence. However, we must first be sure that what we see in it is a reality and not a simple concept.

B. The reality of corporeal quantity has not been doubted by common sense nor by the scientists. It has been doubted only by the philosophers.

1. *Why have they denied it?*

a. Following in the footsteps of Descartes, *Berkeley* first denied the objective reality of sensible qualities. Then he observed that extension is not known to exist unless through the medium of those qualities : colors, pressures... ; it therefore seemed logical to him to deny the objective existence of extension, which Descartes had held although denying sensible qualities.

b. *The idealists* admit no other reality than thought and the thinker, under the pretext that all is absolutely thinkable : extension then is nothing more than the object of thought. They find another proof in the power which my thought has of constructing extension at will through arbitrary postulates : thus human reason is able to renounce the Euclidean postulates and imagine non-Euclidean geometries at less than three or more than three dimensions.

c. *Kant*, with more restraint, hesitates to affirm the value of sensible knowledge. According to him, space is " the form " of every sensation related to the external world of phenomena, since I am not able to sense anything outside of me except the extended, the spatial. However, we can not conclude from this that the world is extended, for if we are not able to sense in any other fashion, this comes from our nature as a sentient being, and not from any characteristic of the world. This " form " of space is " a priori, " that is, not formed either by experience or by any real data.

d. Finally, according to *Kant*, to affirm the reality of extension involves an insoluble antinomy, and we are forced by necessity to admit two contradictory conclusions at the same time, one in which extension is formed from simple parts (actually, if it was formed of composed parts, it would suffice to suppress the composition in order to suppress the parts themselves), and the other, that extension is formed of parts which are always composed (actually, the parts of extension are always divisible). (Cf. E).

2. *The examination* of these reasons belongs to epistemology; it establishes the answer thus :

ad a. Sensible qualities are not purely subjective. On the contrary, they furnish us with the intuition of an objective existence and with the intuition of the concrete relations of succession, simultaneity and, especially, exteriority.

ad b. The principle of the integral immanence of the object in relation to the subject, which is the base of idealism, is manifestly false. Experience resists intelligence, and intelligence knows no way of totally grasping it. On the other hand, although mathematics may attest to the powerful constructive force of the mind, nevertheless its principles cannot depart from the data perceived intuitively in experience, e.g., notions of a line, of a point, of a plane, of an angle, of extension, of division....

Thus the common notion of extension is only the abstract intellectual expression of a reality grasped by a sensible intuition. Mathematical space itself is a concept drawn from experience. If it is constructed in some way by the mind, it is with the aid of materials whose origin is sensible.

ad c. Kant has shown himself a little bit too timid. Guarantees for the reality of sensible data, and particularly of extension, are not wanting (Ci. 3, positive reasons). In me sensation is not the pure reflection of things, nor is it simply a creation achieved by my sensible powers. It is an alliance, a union between me and things.

ad d. The Kantian antinomy is not compelling. Its first alternative is false : it supposes that one affirms not only the

reality of extension, but, also, as did Descartes, its character of substance. It is very true that a substance can only be simple or composed of simple principles, for substance must possess existence of itself, it must in a way be absolute, having a value in and for itself. Extension, however, always composed and always divisible, as the second part of the antinomy affirms, is in no way substance. It remains, whether as simple "a priori form," or as given in experience, a "phenomenal" reality, completely relative to substance, existing in it as an attribute, preparing it for all kinds of relations with other substances. Let us not be led by this antinomy to doubt the reality of extension, but let us be on our guard against Cartesian mechanism which has elevated extension to the dignity of a substance.

To suppress all composition in extension is equivalent to suppressing extension itself, since extension is essentially composed. The first part of the Kantian antinomy is therefore a complete sophism.

3. *The positive proofs* of the reality of extension can be drawn :

a. From the psychological analysis of sensation. It obliges us to recognize extension as an intuitive datum of tactile and visual sensations. All efforts to construct the notion of extension from purely qualitative and subjective data have failed.³ They will always do so, because the idea of "outside of" is a simple relation which cannot be constructed from materials of another nature. Such an idea can be drawn only from an intuition. On the other hand, if extension were non-objective, one would have to explain the illusion which makes us apply it to objects in order to "externalize" and localize them. Now no bridge will ever permit us to pass from a psychological impression, which is supposed to be purely qualitative, to the extension of a corporeal ego, and then to the extension of an exterior world.*

b. From the evaluation of the experimental sciences. These sciences, although they are not the only ones, nor the

* This is a reference to many of the empiricist psychologists of the 18th and 19th centuries who denied that extension was a primary datum. Baudin, *Psychologic*, p. 195.

♦ Baudin's criticism of this position, *Psychologic* (Paris. 1919), pp. 258 ff.

most profound, give us a true knowledge of reality. Their practical success is a sufficient guarantee of their correspondence with the real. But they' essentially suppose the reality of extension, of distance, of volume, etc. The reality of extension is a condition of the truth of the sciences : the sciences are true, therefore extension is real.

c. From the biological value of knowledge. Our knowledge of the world is made up of quantitative data. All the objects of our perceptions are made up of the very stuff which is extension. If extension is not a reality, our vision of the world is basically nothing more than an illusion. But this is impossible, for our knowledge realizes a sufficient adaptation to preserve and develop our bodily life in that vital milieu which constitutes the world. But what is a knowledge adapted to its object and adapting its movement to it, unless it is a true knowledge? It is therefore true that the world wherein I move and am moved about is an extended world. Extension is therefore a corporeal reality.

C. The continuity of extension (first part of the thesis).

Empirically, every body appears as a continuum to us; it is even this extended continuity which makes us recognize an individual object as a whole perception. To be specific, the consciousness which I have of my body is basically the kinesthetic sensation of spatial continuity; organic life in general demands the intimate linking of cells and tissues : a member separated from a body ceases to live.

Science, however, furnishes us another picture of bodies wherein distinct or separated elements are clearly manifest. Seemingly the progress of science is based on an endless division of extension. The waters of the ocean, which for the senses is a completely continuous volume, were, in the chemistry of the 18th century', a simple juxtaposition of substances. Then it was peopled with molecules; then the molecules were discovered to be formed of atoms. The work of Pasteur (right and left bodies) obliged him to assign a definite place to each atom in the interior of the molecule. Finally, at the end of the

19th century, and the beginning of the 20th, the structure of the atom was delivered to us through the studies of radioactivity. Today, the scientist, who believes his eyes, always sees the ocean as a perfectly continuous extension. If he believes his science, he admits only the existence of electrons of an unimaginable diameter (less than separated one from the other by distances, which, relative to the diameter, are comparable to the distances which separate the planets from each other and the sun. •

Must we renounce the testimony of the senses to save science? There are those who think so and therefore profess idealism. Nothing, however, constrains us to do so. Actually, science does not suppress all continuity. It recognizes in the electron a certain volume, and it does not reduce it to an unextended point except by a simplifying mathematical fiction. On the other hand, the distances between the electronic layers which encircle a positive nucleus are very real and perfectly continuous (it has been shown that several energetic levels exist in these layers belonging to K, L, M and N respectively, with the sole exception of K).⁸ The same is true of the intervals which determine the position of atoms in a molecule. Briefly, science obliges us to correct the testimony of our senses, not to deny it. However, it suggests this question to the philosophers: "Will the progress of science ever arrive at the day when it will be forced to renounce continuity and still keep extension?"

Philosophical analysis leaves no doubt about the answer to this question. Extension is essentially continuous. Actually, extension formed by distant parts A, B, C, D... needs contiguous

• According to J. J. Thomson, the possible diameter of an electron is a quantity between a hundred-millionth and a billionth of a micron. Its "classic radius" is equal to $2.82 \cdot 10^{-8}$ cm. Atoms have diameters of around 10^{-8} cm.

* The electronic layers are designated as K, L, M, N, O, P, Q. K is the closest to the nucleus, and supposedly the most difficult to separate from nucleus. It carries at the most two electrons. L can carry up to 18. N up to 32. O, P, Q, appear only with a smaller number of particles, O has 18, P, 13, and Q one or two in radioactive bodies. *Grison, Témoignage de VUnivers*, p. 158.

parts. It cannot exist without embracing with its parts the intervals which separate them : AB, AC, AD .. BC, BD .. CD, the latter being as real as the former. The extension formed by parts which are distant is therefore a total of parts which are really contiguous, in which only certain ones are considered as positive or full, and the others as empty, or simply pure distance.' But the contiguity, indispensable for an extension made up of distant parts, is itself based upon the interior continuity of its constitutive parts. Actually, contiguous parts are exterior one to the other, and although they be as small as can be imagined, yet they must be said to have their own proper extension. They are, therefore, not reduced to a point or to a surface contact, for, at this point on this surface, they merge into one another. Moreover, it is impossible that surfaces without thickness could be added together to form a third dimension and a volume. The same is true of juxtaposed lines which would never form the slightest linear segment. It is therefore necessary that the contiguous parts of an extension should be in themselves continuous.

From our analysis, we see that the continuity of parts in extension is the very condition of its existence. We need not fear then, that the progress of the sciences will ever reduce extension to a mere sum of points. In this hypothesis, continuity cannot fail to be found under the form of a distance between these points. If the dimensions of the electron are sometimes neglected today, we are not held to limit its electrical properties to any mobile position in space. It is admitted that these properties exercise their influence in extension even to the nucleus of the atom (the negative charge of electrons is equal to the positive charge of the nucleus and neutralizes it in a non ionized atom). And it is equally admitted that these influences go beyond the limits of an ionized atom.

' The *void* of physicists is never an absolute void. An absolute void would be the absence of all experimental reality. If sound does not transmit itself in a void, light and electro-magnetic actions, in a general way, do so very well. This " void, " however, is always populated, if not with atoms, at least with particles and the waves associated with these particles.

We should not be astonished at the opposition which exists between sensible and scientific experience. We are not so astonished when we speak of the form of the earth, of its movement, of the vastness of the sun... The senses know in their manner, the sciences in another. The senses have limits which the sciences often go beyond. I am wrong if I interpret sensible data badly, if I deny discontinuity when my eye grasps only continuity. However, the value of sensation need not be lessened because of the possibility of errors in perception, since science has taught me to avoid them. Sensation grasps the continuity of extension. Science teaches me that the demarcation of the parts of extension is not that which my eyes lead me to affirm, that this demarcation cannot be seen or touched, but must be found through the long detours which it has taken the intelligence of man centuries to discover. Finally, philosophical reason sees that without continuity of parts, extension would never be extended. It recognizes implicitly then :

D. The potential multiplicity of extension, its divisibility (second part).

There are forms of extension which possess an actual multiplicity of parts. They are those derived forms whose parts are either distant or contiguous. Each part is enclosed by the limits which are proper to it. It perfectly fits the definition of a part, completely determined, "actual" in the Aristotelian sense of the word.

Continuous extension, on the contrary, is "actually" undivided and one. It conceals, however, a multiplicity that is as essential as its unity. Extension is an exteriority of parts in which one is in relation to the others. Where the unity is absolute, nothing of a thing can in any sense be another outside of it. The very understanding of extension is summed up in "one outside of another," which makes extension essentially a duality. Moreover, one can divide the continuous, that is to say, clearly mark the opposition of its parts by marking the limits which will distinguish them individually and make

- Such arc : a pile of stones, a prairie, a forest.

them complete " actual " parts. However, this division does not create the reality of these parts. It only determines their proper limits which they lack in a state of indivision. Continuous extension is therefore multiple, but it is a multiplicity which is as yet undetermined, " potential. " Undivided or continuous, it is divisible, because its parts, as real as they are, are only potential to being actually individualized.

As all extension is fundamentally continuous, all extension is also essentially divisible, and its potential multiplicity can become actual through division, which assigns to each part its proper limit.

But the divisibility of extension poses a complex question : Can one realize or at least conceive of this divisibility to the point wherein division will no longer be possible?

E. No. The divisibility of the continuum is *indefinite*. This answer of Aristotle, which opposes that of the Eleatics and especially that of Zeno and that of the Pythagoreans, to whom Plato remained faithful on this point, marks an historic date and a conquest in philosophy. It is actually intimately connected with the hylomorphic doctrine.

Zeno thinks of extension as having a *limited divisibility*. One must, according to him, come to a moment when division will arrive at indivisible parts; but, if this were true, then extension would be a total of unextended parts, which is absurd. In affirming the ultimate indivisibility of the continuum, Zeno prefers to say that the sensible experience of division is mistaken, rather than to pose a contradiction in intelligence.

The Pythagoreans admit the hypothesis rejected by Zeno : volumes are formed by surfaces, surfaces by lines, and lines by points. They mask the absurdity of this hypothesis by thinking of the continuous as having a *divisibility* which is strictly *infinite*, that is, imagining a continuum which is made up of an actual infinity of parts. They are mistaken in imagining that a multitude of parts, because they would be infinite, would be able to furnish a whole of another nature than the parts. An infinity of points would never make anything except an infinity of negations of extension. If they touch each other,

they are still only a point; if they are separated, there will certainly be an extension, a line for example, which they will define, but this extension will not be given by the points. It will exist before them as the very condition of the distance between them.

Aristotle recognized in extension an inexhaustible *divisibility*, unlimited, *indefinite*, "infinite" in the sense that division is never able to be pushed to the point where it will be absolutely impossible. This is to admit, with Zeno, and with reason, that extension cannot be a total of unextended parts. It likewise affirms, against Zeno, that the parts of a divided continuum, no matter how unimaginably small, are still divisible, and this by their very nature.

Metaphysical proof. Every continuum is essentially divisible, being essentially composed of undivided parts (cf. D). But every part of a continuum, no matter how tiny it may be, is continuous. Every part of a continuum is therefore divisible.

In order that division would ultimately become impossible, it would be necessary that the parts to which it was ultimately reduced would be unextended, and that these unextended parts would have to explain an extended whole, but to admit this would be to resurrect the error of the Pythagoreans. An extended continuum is therefore indefinitely divisible.

Euclidean geometry offers a clear demonstration of this assertion. The segment A'C' is indefinitely divisible by a secant common to two parallel lines AB, CD, passing through A' and C', when it turns around the point C in such a way as

to cut A'C'. Actually the secant will never be confused with the line CD, for then it would become parallel with the other straight line AB, which by hypothesis it cuts. It will therefore cut the segment A'C' indefinitely in the degree and measure that its intersection with AB is extended away from the point A'.

The demonstration can easily be continued for surface and volume. It will suffice to imagine that $A'C'$ is a straight line common to two planes which touch each other at the surface or interior of a solid. One can draw planes perpendicular to the straight lines AB and CD , passing C and every point where the secant cuts $A'C$. These planes will divide solids into an endless series of slices.

Objections. 1. It can be objected that this demonstration rests on the supposition of a spatial "infinity." If we can indefinitely divide $A'C$ it is precisely because we suppose AB to be indefinite. Whether or not spatial infinity is or is not a characteristic of bodies, all that is required for this reasoning is that it be thinkable. Actually we will prove that real space is finite both in theory and fact. However, if it is necessary that real space have limits, it is not necessary at all that it have precisely such and such determined limits. Therefore it is possible for space, by its nature, to be extended beyond the actual limits. The infinity of space is nothing more than the possibility of its extending beyond the given limits. It is, therefore, perfectly legitimate in reasoning on the nature of extension, but not on its conditions of fact, to admit this possibility which is essential to it.

2. It can be further objected, this time against the thesis itself, that infinite divisibility implies the existence of an infinite number of parts existing at the very core of a finite continuum, which is a contradiction on two counts : a number is always finite, because it is a measure; and an infinite number can never equal a finite reality. These reasons are absolutely correct, but an infinite number of parts is not necessary at all for a justification of the indefinite divisibility of the continuum. The parts of a continuum are not determined, nor do they form a number unless by reason of a previous division which marks them out. Now division always produces a finite number of parts. The indefinite divisibility of extension thus corresponds to the indefinite possibility of increasing a given finite number. Far from demanding, as a consequence, the possibility of a properly infinite number, it absolutely excludes this. Let us

remark here that mathematical infinity is simply a type of indefiniteness. It is only relatively definite, it is any dimension which can be considered as going beyond the limits given.

3. Finally, it can be objected that corporeal extension can not be divided beyond a certain limit, yesterday the atom, today the sub-atomic particles. This objection obviously shows that we know of no force capable of dividing an electron, but even if it could be proven that such a force does not exist, it would not shake our thesis concerning the absolute possibility of division. The divisibility of which we speak expresses the continuous nature of the tiniest particles of extension, and not the power or the impotency of causes outside that value. Extension offers an inexhaustible field for division, but it is indifferent to the fact of division itself, which in no way alters its nature.

F. The limitation of extension is, however, a physical fact, and a metaphysical necessity.

Physically, all corporeal extension is enclosed by surfaces which determine it and give it a * figure." Empirically we distinguish bodies by their contours and we recognize them by their forms. The physicist, the naturalist, or the chemist, only make this natural method more precise when they apply themselves to the recognition of the structure of light, of an organism, or of a molecule. Actually, structure is the assembly plan of parts found in a whole, a system of relations in distance, which situate these parts, limit them and determine them. These relations and these limits cannot fail to be finite. But scientific statement does not suffice here. It lacks necessity and universality.

A metaphysical analysis makes this necessity apparent.'

• See *Summa Thol.*, I* pars, q. 7, a. 3. This demonstration supposes extension to be either recognized as an accident of substance, or determined in a geometric form. However, we can get the same conclusion in another way. Extension is necessarily finite. Extension cannot really *exist* unless it is determined, since it can be *thought* only as it is determined. Hence it happens that there is no *science of* extension, unless it is a determined or figured extension.

Extension demands limits "per se," that is by virtue of its very nature. Extension is divisible, and only the finite is divisible. It is therefore necessary that extension should have actual limits. Let us imagine a quantity which by hypothesis would be infinite (without any limit). Let us suppose this extension to be divided into two parts. We must then admit one of the following three conclusions: these two parts are both finite, or both infinite, or one finite and the other infinite; now each one of these three consequences is impossible to thought. This implies then, that the hypothesis of an infinite extension is impossible. The first consequence is impossible because two finite parts cannot be added to each other to form an infinite whole; the second is also impossible, for division introduces limits in the whole which it divides, and demands that the divided parts be finite. The third, finally, must be impossible for the same reason: the supposed infinite part would nevertheless have a limit which would oppose it to the other part which is supposed finite. Thus extension is necessarily finite. Its finite character is inscribed in its essential divisibility.

Psychological reflection confirms this analysis. I am an extension limited by the surface of my body, and I am an individual distinct from the rest of the universe. Does the non-ego form one single individual? Then its extension is finite. Actually, my proper extension is distinct extension, but if the extension of the non-ego were infinite, then mine would be made a part of it (for one cannot add to the infinite), and I would be confused with the unique whole. Shall we suppose that the non-ego is made up of a number of material individuals? Then each individual possesses its own extension and therefore its quantitative limits.

Limits are therefore necessary to corporeal extension. They are possible under the form of surfaces, of lines, of points; they are extension itself, denied in one or in several of its dimensions; they are therefore real, but they are not parts of extension. Considered by the mind apart from the continuum which they determine, they are as such pure objects of thought ("entes rationis"), not being able to exist as such.

An objection is presented here from a geometrical point of view. The geometrician is able to conceive an infinite extension, that is, a straight line or plane. It is, therefore, not contradictory that extension lacks limits. The answer is easy. To conceive an infinite extension is to conceive that it can be extended beyond the given limits, and this always and necessarily; it is to think of extension without attributing to it precise limits, or to refuse to hold it to certain determined limits. But this is not to say that extension is realizable or even thinkable without any limit. We will draw from this objection only this conclusion : it is not contradictory to think of extension without thinking of its limits, and thus a fortiori without thinking of perfectly determined limits; in other words, the determination of limits is not a consequence of the nature of extension. This nature certainly demands limits, it is not able to furnish them. As it is indifferent to division, it is also indifferent to increase. Therefore, the objection obliges us to pose this question : How does extension receive its determined limits? The following chapter will allow us to give the answer. It will concern itself with the quality which penetrates extension, and especially with figure.

Conclusions. The essence of corporeal quantity can be defined as the *internal extension of parts*, that is to say, the mutual exteriority of parts from within their common limit. This definition can only be a description, if it is true that extension is a simple, intuitive datum. The role of this definition is to highlight the fundamental attribute of corporeal quantity, and for the moment it fulfills that role. Actually, all the attributes of extension necessarily flow from and suppose the mutual exteriority of its parts.

One has the right, undoubtedly, to define extension in another way, but on condition of placing one's self at another point of view than that of its nature. Thus, for the mathematician, it is the measurable;¹⁰ for the physicist, it will

* It is just as natural to symbolize variations of correlative dimensions by curves (geometrical extension). In a uniformly varied movement, the parabola thus symbolizes the variation of the space covered in function of time.

be the impenetrable :¹¹ so each defines extension according to the property which concerns his science. Corporeal extension verifies these diverse aspects. The one essence which they reveal is that in order that reality be measurable or impenetrable, it is necessary that it be made up of parts exterior one to the other.¹² The particular definitions of extension, therefore, demonstrate the exactness of our definition.

Second Question : What is corporeal *quality*?

Second Thesis : Corporeal qualities are :

1. discontinuous, *heterogenous* and contrary;
2. *simple* and indivisible;
3. endowed with *intensity*;
4. *determinative* of corporeal *quantity* ;
5. *distinct from extension*.

A. Notion

1. Empirically, quality very often refers to certain values : practical utility (goods of a fine quality), beauty (of a work of art), morality (of an association, of certain reading), knowledge (intelligence is a quality superior to memory). Properly and originally, it designates that attribute of corporeal objects which makes them perceptible to our senses. The "qualities of bodies" are the specific objects of our external sensations, such as colors, pressures, odors and tastes.

2. Science first attempted to know bodies qualitatively." It considered them as composites of four elements (Empedocles, 5 B.C.) in which each was defined by its proper qualities : earth is

"Particles, atoms and molecules are impenetrable in varying degrees (which is supposed by their impacts and the movements which result from them); fields, however, are essentially penetrable.

"Every effective measure is reducible to a measure of length.

" See A. H. Armstrong, *Introduction to Ancient Philosophy* (Westminster : Newman, 1949). pp. 1-8. Also A. Van Meisken, *Philosophy of Nature* (Duquesne Press), pp. 48-51.

an element which is dry and cold; water is an element which is humid and cold; air is an element which is humid and warm; and fire an element which is dry and warm. Only tactile qualities are utilized; the others, especially visual qualities, thought to be less fundamental, are left in shadow. The Renaissance, through its mathematical development, prepared the revolution which Descartes realized by the intuition of his genius. Science then turned itself away from the qualitative in bodies because it saw no practical inventive knowledge resulting from the study of these qualities. It wished to measure bodies in order to understand the laws governing them, and thus hoped to be able to deduce these laws and understand phenomena by identifying them among themselves (E. Meyerson). It applies itself so rigorously to this method that it is often paralleled with a mechanistic metaphysics, particularly that of Descartes, which states that qualities are purely subjective and that the only objective reality is extension endowed with movement. The problem, therefore, is to show that bodies which in appearance are colored, sonorous, having odor, warm, etc., are determined figures of extension, agitated by certain movements. Science had already partly resolved this problem, but now it applies itself to the completion of this solution by showing that the discoveries of the past were not the last word on the nature of qualities. The scientist can now say: color is a vibration of electricized particles emitted from atoms, heat is an agitation of molecules. He does not say that color and heat are only that — and so he continues his inquiry. He now finds qualities which are not able to be reduced to extension, such as hardness, which he tests but does not measure.¹⁴ Science continues to reduce qualities to extension and movement, but only by substituting for sensible data determinations of size, of situation, of direction and of speed, which are so many new qualities, since they are expressions of numerical relations.

3. Philosophically, quality must be extended to every determination which confers on bodies other attributes than

¹⁴ This testing is done, however, according to several processes, which do not assign a constant order to bodies which are of unequal hardness.

those which are proper to extension. Thus we are able, in taking stock of the evolution of the sciences, to discern three classes of corporeal qualities. (1) *Figure*, which confers on extension precise limits and therefore gives an external and internal form. (2) *Forces*, which cause corporeal changes. These forces are physical (heat, electricity), chemical (valence, affinity), mechanical (attraction, repulsion, mass), and they constitute the diverse forms of energy, whether kinetic (that of a body in movement), or potential (that of a body in repose). In supposing that the total quantity of energy is constant (the principle of the conservation of energy), science establishes the laws of equivalence (the mechanical equivalent of heat, for example), and shows us how to understand through these laws the transformations of diverse forms of energy. (3) *Sensible qualities*, which manifest to our senses the existence of bodies and reveal certain relationships existing among bodies.

B. The reality of corporeal qualities is admitted by both the average man and by the scientist, but the former thinks primarily of sensible qualities, and the latter of forms of energy.

1. *The reality of sensible qualities is denied* by certain philosophers :

a) because sensible qualities are only psychological modifications. In the judgment of Descartes and of Malebranche the errors of the senses are sufficient proof that these qualities do not belong to corporeal reality.

b) because sensible qualities are unthinkable. I cannot have a clear and distinct idea of them, and so they are able to exist only in my imagination (Descartes).

c) because bodies are purely passive. They do not possess any active forces. Thus Malebranche denies to them any causal function and reserves causality only to God.

Upon such reasons these philosophers have built their mechanism (Descartes and Malebranche in the 17th century), their occasionalism (Malebranche), and their idealism (Leibniz in the 17th, Berkeley in the 18th, and Brunschvicg in the 20th century).

2. The *weakness of these reasons* is already a proof of the reality of these qualities.

Ad a) Sensations are, certainly, psychological modifications. But they are also essentially relative to an object which they attain by an intuitive knowledge.* The errors do not come from sensation, but from its interpretation by the imagination, by the memory, by reflection, briefly, by reason of the judgment which appreciates the phenomena. In any case the errors cannot be imputed to the senses. Since sensations are not pure psychological modifications, they are then concrete intuitions. The objects of sensible qualities are something different from constructions of the mind. They are real data which are grasped in an intuition.

Ad b) It is true that I am not able to give to each sensible quality a definition which expresses its nature, but I have an idea of it which permits me to distinguish kinds and degrees, and which is sufficient for the starting point of physics. (This against Hamelin, who has attempted to show the mental origin of qualities).* Moreover, the criterion of reality invoked by Descartes is very incomplete. There is a reality which the clear and distinct idea alone knows through itself, namely, the *reality of essences* and the relationships between these essences. It is the reality which mathematics studies. There is also a reality which man does not know by a clear and distinct idea, namely *the reality of existence*, which is attested by a concrete intuition. The clear and distinct idea never suffices for knowing the existence of any being or of any fact. For example, the ego is real, but it is not so because Descartes can give a mathematical definition of it in which he recognizes the real. Ultimately the ego is real because one has an experience of it.

Ad c) The notion of cause does not have the absolute rigidity which Malebranche gives to it. For him, to cause is*•

*F. van Steenbraken, *Epistemology*, pp. 113-128, trans. into English by Flynn.

*O. Hamelin, *Essai sur les Éléments Principaux de la Représentation* (Paris : Alcan, 1907), p. 134. He accepts the Cartesian principle "It is only in making ourselves see that quality belongs to thought, that we are able to experience the reality of it." (p. 146)

to produce something with full independence. Such a notion evidently is not verified except in God. But this absolute notion is drawn from a relative notion based on our internal and external experience, the experience of an ego, which is at the same time dependent on sense objects and yet holds them under a certain dependence which is spiritual (voluntary) and mechanical (muscular). There exists between me and bodies a dependent causality. This is an intuitive datum and it is in this that I find the materials of my idea of an independent cause manifestly constructed. Undoubtedly, bodies are not the first source of their activity, but they are holders of it whether natural (specific forces, e.g., affinity, mass), or accidental (transitory forces, e.g., local movement). In both cases they are apt for causing change about them. The} are active.

3. The *-positive proofs* of the reality of qualities ought to be distinguished according to the groups of qualities. Let us consider :

a. Figure

1) The condition of the existence of extension is as real as extension itself. Actually extension exists only as it is determined by limits (Th. 1,4), which are in a definite relation among themselves. Now figure is only a relation of limits among themselves. Figure being a real relation between real extensions, it cannot lack reality.

2) Object of all the sciences of nature, it is as real as these sciences are true.

a) The biological sciences rest on the study of form (morphology) and of organization : their descriptions are concerned with forms; their classifications put them in order; their laws suppose them in explaining progressive construction (ontogenesis), modified under the influences of environment (adaptation), either through the course of the ages (evolution) or through reproduction (theory of heredity).

b) The sciences of matter uncover definite structures hidden to the senses : those of a crystal, of a molecule, of an atom.

of a nucleus, those of light, and of electricity. Others give precisions in regard to the structures of the earth, of the stars and of nebulae. To know scientifically means, first of all, to be able to know a structure. Thus to deny the reality of figure is to deny the truth of science.

b. Forces, or energy

are measured by science and they give some grasp of the reality of the world. Their reality is as necessary to the truth of the sciences as the reality of structures, and that reality is certain.

Objections :

1) It may be objected that bodies are defined by their inertia. The fundamental principle in every study of matter is this : no body will change its state of movement or repose by itself. Is this to say then that science does not recognize in bodies any power of action? Not at all ! It simply states that any change of a body is not to be explained by the simple existence of this body. It demands that there should be factually the influence of another body.¹⁷ The inertia of bodies is, therefore, the absence of the activity of a body on itself, yet it is also, reciprocally, the possible action of one body on another.

But science enables us to go further. It obliges us, first of all, to see in inertia something other than an indifference to movement. The force necessary to displace 1 cubic cm. of lead is different from the force necessary to displace, in the same conditions, 1 cubic cm. of cork. The inertia of lead is, therefore, different from that of cork, and the inertia is therefore a kind of anti-force, a force of reaction. Thus to affirm the existence of inertia is also to affirm the existence of force. Moreover, science very explicitly recognizes in inertia a determined qualitative character. It measures it and calls this quantity mass.

¹⁷ This principle is basically no more than the principle of identity, applied to the domain of movement. Supposing a particular body in a *given* state of movement or repose, it would be contradictory for me to suppose that same body as having simultaneously *another* state of movement or repose.

By reason of mass it measures force, which is at the same time a function of mass and acceleration, $m \times a$. If science admits the reality of mass and acceleration, it admits by the very same fact the reality of force.

2) It will be objected, however, that the sciences speak of force in a sense which is not that of everyday language, and therefore is no longer qualitative. Force, for the average man, is that which he experiences in his feeling of willing, and in his sensation of muscular effort. It is a productive cause in his thoughts and in his sensible changes. Its qualitative character is evident. On the contrary, for the scientist, force is a dimension, a quantity, which is measured in relation to other quantities, and particularly in regard to displacement in space. It is only a movement in extension and therefore no longer possesses anything of the qualitative.

It is true that the scientific method abstracts from every psychological quality, and uses the term force in a sense which is no longer directly qualitative. But the philosopher has the duty not to neglect anything of the real. To say that the whole reality of force is reducible to that which the physicist measures is not to speak as a scientist. It is to give a metaphysical interpretation of science which is called mechanism, and this is an erroneous interpretation. On the contrary, we must insist that, if the mathematical method permits science to grasp an aspect of the real, to know its relations of measure, it ignores other aspects, which are imposed on the attention of the philosopher, viz., the *active* character of forces and their *qualitative* character.¹⁸

a) The *active* relations of *causality* between bodies cannot lack reality, if their movements are real and if their immediate cause is found in bodies surrounding the mobile object. Now the

¹⁸ This is true of scientific formulas. The scientist does not ignore the *causal* nature of forces. For him, measure is only a method. His aim is to explain changes by linking them to their causes, but he is not satisfied with the explanation, until the *dimension* of the effects is equal to the *dimension* of the causes. Thus a rationalized causality is disguised under the formulas of measure. See M. Gillet, *La Philosophie de M. Misyerson*.

Third Thesis will show that the first and second conditions are both realized, for the movement of a mobile object depends evidently on those bodies which are in relation with it, e.g., mass, speed and direction of the movement-cause which has released the movement-effect.

b) Moreover, the *relations of measure* to which science reduces forces are *qualitative* and *real*, for in the real these measures demand certain determinations upon some object which is determined. No measure of bodies will therefore be possible, unless these bodies are determined in their extension, that is to say, endowed with qualities. As a matter of fact :

(1) Movements are differentiated by their speed, their organization (periodic or not, uniform or not, accelerated or retarded), their direction and the mass of the mobile object.

(2) On the other hand, the forms of energy are really diverse and are only unified in the abstract because of their equivalency in regard to measures. This equivalence, so striking in its mathematical aspect, should not make us forget those differences which the diverse co-efficients of formulas of equivalency indicate in their way,¹⁸ nor on the other hand, the real contingent nature of the measures of these forces. Energy is thus recognized as *qualitatively diverse*.

Even the scientist does not confuse the *mathematical* study of possible movements with the study of movements realized in *nature* : stars, planets, animals and plants, molecules, atoms and sub-atomic particles. If we compare the domain of *possible* movements with the domain of real or *natural* movements, the second appears as a determined portion of the first. The movements of the first group and those of the second will undoubtedly be expressed by identical mathematical formulas, but the scientist knows well that he should distinguish the second by a *proper quality*. He knows them to be *real*, natural, and it is precisely because of this that he feels the need of consulting the subject, the nature itself, by the indispensable methods of observation.

* One small calory — 4.185 joules = 4.185 x 10¹⁰ ergs.

To deny the reality of corporeal qualities will, therefore, be to deny the distinction between mathematics and the sciences of nature, and to confuse their two methods which are so diverse at times that they seem to be opposed.

Conclusions : The scientist affirms what he knows, namely, that there are forces in the sense of relationships of measure, and we ought to accept this, but he has no right to deny what he ignores by his method. There are also relationships of causality which are at the base of these forces and which are active. Finally, there are even qualitative determinations in these forces, affecting extension and local movement, and specifying these forces. This is what is revealed through philosophical analysis. As to the fact that science is interested only in relations of measure, we can still say that its mathematical and experimental method proves nothing against the existence of active forces. It teaches us that the scientific concept of force is distinct from the empirical and philosophical ones, but in no way does it prove that the latter are without real value.

c. Sensible qualities

manifest their reality if we reflect on the methods which have led us to affirm the reality of extension. Sensible qualities are real :

1) They are intuitive data, because they are the proper objects of sensations. On the other hand, their simplicity is a proof that they have not been constructed. One born blind cannot acquire the sensible notion of color, although he can acquire the scientific notion as a determined kind of vibration.

It may be objected that the scientific notion is the only true one, that color is nothing more than movement in extension. This would be to forget that color would still be a quality, since it is still a form of energy; it would also be to forget that the scientist has not the right to deny what his method only authorizes him to put aside.⁰

* See above b, and de Tonquedec, *Critique de la Connaissance* (Paris : Beauchesnes, 1929), ch. 3.

One can also object because of the errors of the senses. How can an intuition be false? Let us answer that intuition is always true. If I see a quality, that quality exists, but the attribution of qualities to objects, that is to say, their interpretation and their predication of certain precise objects, is no longer an intuition.

2) They are the condition of the truth of the experimental sciences. The experimental sciences know extension, but as it is qualified by sensible qualities. Undoubtedly, the sciences have gone beyond the point of view of sensible qualities in their research, but their starting point is in these same qualities, and the reason for this is not to deny their existence, but rather to explain them. Suppress all qualities, and of what will the sciences treat? The value of the conquests of science, moreover, is subordinate to the value of their starting point, for this starting point remains the necessary means of controlling hypotheses by which they wish to explain things. The experimenter can complicate his apparatuses. He will never read their indices, unless colors have for him the value of a reality. In this way the task of the sciences is in vain if sensible qualities are only an illusion.

3) They are the condition of the biological value of our knowledge of the world. This knowledge would be altogether false, if sensible quality were only a psychological impression, for it is exactly the qualities attributed to the objects of our perceptions which regulate the usage which we make of them. The very different values which objects have for us can be in part subjective, but they cannot be completely so.

4) They are necessary for the existence of sensations and for their specific character. Actually sensation is something which is given to me as real, whereas the products of my imagination do not have this real quality, and this is precisely because the object of sensation is imposed as being independent of me. This is quite different in regard to the object of the imagination. On the other hand, the nerves have a specific energy, but there must exist excitants specific enough to make them function,

and thus the specific character of sensible qualities as well as the existence of sensations lead us to the reality of their excitants.

N.B. — We are here treating of sensible qualities and not of sensed qualities. This distinction eliminates very many objections. The sensible quality must exist in another way than in the active sensation. On the contrary, the sensed quality exists only by virtue of sensation.

C. The heterogeneity of qualities is their most outstanding characteristic. (First part of the thesis).

1. *Empirically*, they form distinct kinds (they are heterogeneous). Color is not sound. We do not pass from one to the other except by a leap, by a complete suppression of a specifying characteristic, and by the replacing of it with another (they are discontinuous). Color is a "visible" quality, sound is an "audible" quality, incapable of becoming visible little by little. Finally, they can be distinguished to the point of mutually excluding each other from a given object (they are contrary). A paper which is red is not able to be green at the same time, a mobile object cannot at the same time be going from A to B, and from B to A.

2. Contemporary *science* seems to deny this heterogeneity. (1) The unity of physical forces is expressed in two ways : (a) all forces are only movements, some molecular (matter), others undulator}' (rays); (b) all forces are only forms of an energy whose sum remains constant. (2) The unity of matter is a definitive conquest. The specific qualities of "simple" bodies (elements) are reduced to unity, since they are all constructed with the aid of identical elements, sub-atomic particles which are able to enter into transformations from one element to another, for example, hydrogen from carbon, from sodium, and from aluminum. (3) Energy and matter, through a new progress, are unified in the Einstein theory (1911) completing that of Lorentz (1895). As does matter, so energy possesses inertia, and matter is formed of electrical energy. Thus radium loses its mass and transforms it into energy. This is done in such a way that what is left is not mass on the one side and energy

on the other, it is the total mass plus energy. "The equation of Einstein, $E = mc^2$, expresses the equivalency of mass, m , and of energy, E , having as a factor the square of the velocity of light, c ." (4) Finally, the quantum theory of Planck, and the wave mechanics of Louis de Broglie show the analogy, if not the unity, of rays (the waves are formed of particles or quanta of energy) and matter (the electrons in the atom are associated with material waves). This theoretical unification is of a kind that any physical reality, whatever it may be, is constructed with the aid of elements which are always the same, of extended particles and waves. It is a unique structure, at the same time corpuscular and undulatory, continuous and discontinuous.

What must we think of these affirmations? In looking for resemblances which are not apparent, science is certainly within its scope. However, to affirm these resemblances, is not to deny the differences. The same genus is able to contain many species. Moreover, the resemblance stated by science is of the mathematical order, and in no way prohibits dissimilarities in other orders. Insofar as the realities are measurable, they verify the same general theorems, and are subject to the same common laws. But what remains here in each which is specific and individual? Even in the mathematical order itself, there are shown to be specific differences recognized by science, e.g., the yellow ray of sodium has specific numbers, expressing its wave length in frequency . . . Hydrogen has only one peripheral electron, while helium has two. Moreover, in progressing, science has not only marked the more and more general resemblances, it has concerned itself at the same time with expressing differences, which are subordinated, and this concern has led to the discovery of discontinuities hidden up to this time. Thus one can imagine the ability to pass from the color red to orange in an almost insensible transition, but physics has discovered in the spectroscope perfectly distinct rays constituting irreducible kinds. Finally, if the ultimate constituents of matter are particles of electricity, we must recognize in them at least two kinds, the

"Hausmann-Slack. *Physics*, 4th ed. (Princeton : Van Nostrand. 1957). PP- 761-763.

positron and the negaton. We must furthermore admit a third element, whether proton or neutron, which makes the two electricities dissymmetrical," whether by reason of structures and properties, or simply by properties. It is at least of such a kind that the science of today has given up the thought of unifying matter and energy completely. "The discovery of the neutron seems incompatible with the original and purely electrical conception of matter . . . One must now consider these two entities as distinct . . ." (L. de Broglie, *R. de M. et de M.*, 1936, p. 185).

In the measure that science deciphers the intimate structure of atoms, it has not ceased to increase the number of *elementary particles*, and it characterizes these particles by *three differentiating qualities* :

The electrical charge : positive, negative or null;

Mass: light, medium, very heavy;

Spin: this is a property responsible for the rotation of a particle in one direction or in another, analogous to the differentiating character of two tops spinning in contrary directions. "

¹³ The dissymmetrical quality of two electricities consists in this, that negative particles (negatons) have a very small mass, while the positive particles (protons) have a mass which is 1.836 times greater.

¹⁴ The neutron is a particle with a mass which is approximately that of a proton, yet it has no electrical charge. Its mass, then, can not have an electrical origin.

¹⁵ One can find a complete description of the fundamental particles in *Sourcebook on Atomic Energy* by S. Glasstonk (Princeton : Van Nostrand, 1958), pp. 23-62.

Beginning with mass and taking as a unit the mass of an electron, we can make the following distinctions :

Mass = *i* : the *negaton*. bearer of a negative electrical charge (it constitutes cathodal rays and the beta rays of radium); the *positron*, bearer of a positive electrical charge.

Mass 220-1000 : *mesons* or *mesotons*, divided into several kinds : *Mu*, *Pi*, *Tau*, are different by their mass, which equals respectively 200, 300, 500, each carrying a unitary electrical charge which may be positive or negative.

Mass — 1836 : the *proton* or *H* has a positive unitary charge; the *neutron* or *n*, without any charge.

The particles which principally constitute the atom are : protons

To sum up, science states a generic unity for all measurable physical reality. It is not able to deny specific differences, and at most, it is able to ignore many of them. However, it expresses many of them in its own way, but in mathematical language, since specific differences cannot be translated except by different numbers.

3. *Let us philosophize now.* A complete philosophy would suppose a complete classification of corporeal qualities which assigned to each its proper place. It will suffice to state that at the interior of the same group we find the irreducibility of one quality to another. We have not actually had to demonstrate that each of the qualities discerned by the senses and by science is a kind apart, but we have attempted to prove that there are irreducible kinds of qualities. The privileged case is that of the contrariety of qualities which make them incompatible simultaneous determinations of one and the same extension. Now we find this opposition :

a) Among figures :

1. Crystalline structures¹⁰ are very clearly contrary in regard to the kinds of geometric solids which they realize. Their seven fundamental types also serve to characterize chemical kinds.

2. Atomic structures are still more specific. The same atom is not able to carry two different numbers. H is designated by 1, He 2, C 6, O 8, Cl 17, Ur 92. Chemistry classifies the kinds of atoms according to this number, called the atomic

and neutrons in the nucleus, which are considered in this way as nucleons, whereas the negatons in the crown are properly called electrons.

The positron is very evanescent. Its average life is less than a millionth of a second.

The *photon* or light particle manifests neither mass nor charge, but is produced by the disappearance ("annihilation") of a pair of electrons, one positive, the other negative, and it disappears by the "creation" of a new pair of electrons. See *Sourcebook of Atomic Energy*, pp. 46-48, about the anti-proton.

* See *McGraw-Hill Encyclopedia of Science and Technology*, Vol. 3, pp. 580-608 (Crystals); also M. J. Buerger, *Elementary Crystallography* (New York : Wiley, 1956), and F. C. Phillips, *Introduction to Crystallography*, 2nd. ed. (New York : Wiley, 1956).

number. It admits, however, that the total mass of the atom is able to vary by one or several units because of the addition to protons of a certain number of neutrons. The same chemical kind, uranium, for example, embraces several different kinds, called "isotopes," of atomic masses as distinct as the numbers 233, 235, 238, 239. Hydrogen embraces three of masses 1, 2, and 3.

3. As to biological structures, they are evidently contrarj' one to the other. The eye of a vertebrate has not the structure of the ear, nor does the muscular cell have the structure of an epithelial cell. The organisms are so specified by their morphology that we can classify them according to it.

b) Among forces :

1. Mass, which is translated as density, is a specific characteristic of the atom. It corresponds to the total number of nuclear particles which form its nucleus, e.g., $U = 234$. Atoms differ from one another by one or several units of mass. A continuous increase of mass does not seem to exist. The fractional numbers designating mass do not indicate a possible mounting continuity between the elements, but they are an indication that the measures have a relation to mixtures of different atoms which are very similar because of their chemical properties (isotopes). Thus Cl (= 35,5) is a mixture of three kinds of atoms having as their specific mass, 35, 37, and 39. "

2. Valence is not considered as a characteristic of certain kinds of atoms but of all atoms in general, and the qualities of this phenomenon, from the point of view of chemical combinations, are clearly contrary. Certain atoms have an inert valence, and they do not enter into combinations (helium, neon, for example). The others have valences between one and five; that is, they are each able to combine with one, two, three four or five atoms of hydrogen. Valences are

.T Fractional numbers can also signify a *loss of mass* as well as the fusion of nucleons : this mass is therefore transformed into " binding " energy. For a more detailed exposition of this, see W. Heisenberg, *Nuclear Physics*, ch. 4 and ch. 5.

attached to structures. They express the number of electrons which are able to be given or received by a certain atom. The peripheral electrons are spread in layers around the nucleus. Each layer is "saturated" by a determined number of electrons. From the interior to the exterior, they are encased in various layers in the following manner, K (2 el.), L (8 el.), M (18 el.) etc. The outermost layer is the only one which concerns the chemical phenomenon of valence. If it is saturated, it gives the atom a null valence. If it is nonsaturated, it gives two complimentary valences, one corresponding to the number of electrons in this layer, another to the number of electrons needed to saturate it. The way in which valence is expressed is by whole numbers and divides atoms into specifically distinct groups. Thus O has a valence of 2, the outermost layer L having only six electrons, while 8 are necessary to saturate it. H has a valence of 1, the outermost layer K possessing only a single electron, and able to number only 2 in it as a total. The mutual affinity of H and of O will give a composite of 2 atoms of H and 1 atom of O, thus $H - O - H = \text{water}$.

3. Electricity is characterized by the contrariety of its two signs. It is either positive or negative, and because of the contrariety of its movements, it attracts or repulses. These electrical forces are therefore specifically distinct.

4. Light, in the physical sense, is formed of a mixture of simple radiations which have a definitive wave length. These wave lengths are opposed enough to be used in the recognition of kinds of atoms through the medium of a spectroscope. Everything which the astronomer knows of the physical and chemical constitution of the sun, of nebulae, and of stars, rests on the specific character of light emitted by atoms. The wave length of x-rays is utilized in the same fashion for the same end : proof of its specific character.

c) Among the sensible qualities :

We need not insist on their manifest contrariety. It strikes us in tactile qualities : the smooth and the rough, the soft and the hard, the cold and the warm. In the gustative qualities, we

remark the bland and the salted, the sweet and the bitter. We may also remark in the olfactory qualities, which are very subjective, that they are very much opposed from an affective point of view : aromatic and fetid odors, each odor possessing above all the character of being distinguished from every other. Sounds are opposed to each other as high or low, and as arranged in notes. Colors are grouped in complimentary couples, wherein the contraries are cancelled out as colors, and become a luminosity more or less gray.

We find the scientific guarantees for this contrariety in the sense perceptions of sounds and colors in the definition of wave lengths having specifically characteristic periods. Other sensible qualities have not been translated into mathematical language. For the physicist, cold is something totally different from the common-sense perception of it. It is a state of molecular repose, but this offers no explanation as to why it should be grasped by the thermal sense. Must we conclude that the contrariety manifested here is completely subjective? The proof of this subjectivity must be held as being insufficient. The reality which warms me, may well be more complex than the molecular movement grasped in it by the physicist. No "scientific" guarantee need be demanded, for a metaphysical necessity will allow us to venture the following : that which makes me sense something as contrary to another sensible datum must necessarily possess in itself the reason for this opposite appearance under which it is manifest to me.

Conclusion : We remark in every genus of quality a plurality of species. They have this in common, that they determine extension, but each in its own way. Figure gives precise limits, force gives activity, the sensible qualities which modify our senses make us know intuitively. Without a doubt, figures and forces contribute to modifying our senses, but must we go so far as to say that the reality of sensible qualities is reduced to structure and forces? Those who say this are incapable of proving it, so that we must maintain, at least provisionally, that sensible qualities are a kind distinct from those of figure and corporeal forces.

D. The simplicity of qualities can be deduced from their specific character, but let us rather say that this will be easy to show, if we state precisely the type of simplicity of which we wish to speak.

There is a *notional* simplicity. A simple idea is a notion which is not composed of several notions. Such is the notion of quality in general. One cannot truly define it. However, since there are numerous kinds of qualities, and since a specific notion is formed from a genus and a difference, particular qualities are not simple notions but complex ones.

But is the *reality* of qualities simple? This question still needs to be made more precise, for real simplicities are as varied as the kinds of composition to which they are opposed. Absolute simplicity is accorded to God alone. The simplicity of the soul is no more than relative. It is simple, as a part, but in relation to the whole which it informs it is not simple. To assert the simplicity of a quality is not to deny that it is united to another quality or is diffused in a determined extension. The simplicity of which we wish to speak is precisely that which fails to appear in extension. It is the absence of extended parts in a composition which should form a larger extension. To say that quality is simple is to say that "per se" it is not extended, that it remains that which it is without becoming more or less, no matter what the extension may be in which it is supposed to be realized. "The simple," says Hamelin (*The Principle Elements of Representation*, second ed., p. 151), "as characteristic of quality is this, that in having a nature as complicated as one wishes (notional composition), it remains indifferent to spatial and temporal composition." He adds: "Place a pause on a note and this will not change it insofar as it is a note. A cubic inch of yellow is neither more nor less yellow than a cubic foot of the same color and the same shade."

"Per se" = by reason of what it is; *per accidens*, on the contrary, designates a predicate which agrees with a subject by reason of its actual relation with other things. The two expressions, taken absolutely, may be rendered: necessarily, and in a contingent way.

Actually, it is easy to observe this simplicity in each kind of quality.

1. Figure is the same whether we increase it or decrease it. The relations of limits between themselves are not changed when one increases or diminishes surface or volume. The figure on a photograph is not changed when it is enlarged. Two similar triangles are only one kind of figure, although the marked surfaces are more or less extended. The structure of a microscopic crystal of NaCl is the same as that of a crystal of NaCl having a hundred or a thousand times more volume.

2. Forces. A vibration keeps its wave length whether it fades away after only a few centimeters of distance, or whether it is extended over several kilometers. The mass of an atom remains unchanged whether it is isolated or whether it is united to other atoms which are either similar or different.

3. Sensible qualities are also indifferent to variations of extension. Ten gallons of water are not of a higher temperature than a single drop of this volume.

Moreover, by right, simplicity is a necessary property of quality. Actually, it is the composition of continuous parts which makes extension indeterminate by nature, indefinitely multiple and divisible. Now quality is in itself determined, being a determination of extension. It is therefore not able to be composed of continuous parts, and must be indifferent to every variation of extension. Spatial composition produces indetermination. The qualitative determination is therefore simple.

It should be clear from this that quality is *indivisible*. It is either all that it is, or it is nothing. Division, the operation which assigns limits to parts, is only possible on a reality composed of parts. Thus by drawing a shade half way down over the surface of a window, I do not cut the light of the sun in half. The objection can be raised that *we do measure* quality, and that measure supposes division. It is true that measure supposes division,* yet, on the other hand, we cannot divide a quality.

* Actually, the measure is the relation of a whole to one of its parts taken as a unit. It supposes the whole to be divisible into completely equal unit parts (equivalent), which form a whole by simple addition.

Therefore we must find a way to measure it indirectly by dividing something other than it. We will see how, further on (see H). One can still object that we are concerned with the more or less of qualities, and because of this, they possess a kind of quantity which implies a certain multiplicity, if not of parts, at least of degrees, and makes quality divisible under another heading. We agree that there is a problem here. Let us face it.

E. Intensity is actually an *empirical* character of qualities. It is that dimension proper to quality which makes it capable of increase and decrease without changing its kind. It is expressed by the comparatives, more, less, as much; and the superlatives, very, most: the sun is more luminous than a bulb; the snow is as cold as ice; the sound of a fife is very sharp.

Intensity remains *scientifically* a property of forces. Here the degrees of quality are appreciated with the exactness of numbers, for example, when we state that gravity varies in the inverse proportion of the square of the distance of the body from the center of attraction, or the mass of a molecule of O is 16 times greater than that of H, and half of that of S.

A *philosophical* analysis of intensity has been made by Bergson from the psychological point of view.¹⁰ For him, to perceive a state of consciousness as more or less intense is either "to evaluate the dimension of its cause by a certain quality in the effect," or to perceive confusedly a plurality of varying psychic states which are different and simultaneous. In the first case, two luminous sensations are equal in intensity, because the impressions received are equal, despite the difference of the excitants, e.g., a candle light striking my eye from a distance of one meter, and then four candles striking my eye from a distance of two meters. In the second case, a pain is judged more intense because it is composed of a greater number of sensations corresponding to a greater number of contracted muscles. However, this is not our problem. We are here

*♦H. BERGSON. *Time & Free Will*, An Essay on the Immediate Data of Consciousness, trans. into English by F. L. Pogson (New York: Macmillan. 1913). ch. 1.

concerned with the intensity of corporeal qualities and not with states of consciousness.

What is necessary that quality possess a proper dimension other than that of extension? It will be necessary and sufficient that: (1) it will be realized according to multiple degrees; (2) it will remain homogeneous in all its degrees; (3) its degrees will not be simultaneous juxtaposable parts, but the complete quality such as it is at a given moment.

The first condition is verified :

1. Figure taken abstractly is certainly not subject to intensity. Either it is, or it is not. This is true of geometrical figures : a triangle is not more or less triangular. This is also true of atomic structures, and of molecular and biological ones. This may be the structure of the cockroach, the other that of the herring, but the figure taken in the concrete in a real body, is only more or less perfectly realized. *1

Thus the structure of an organism is the result of a development which realizes that structure more and more. It is perfect only at the term of an evolution. The structure of disturbed crystal tends to restore itself; that of a molecule is more or less stable, more or less near its state of equilibrium, e.g., H_2O is stable, H_2O_a is very unstable. The structure of an atom is either more or less closed or open, e.g., He is closed, H is monovalent, C tetravalent. This structure is more or less solid or weak; the weakness of the atomic structure is measured by its radioactive period. An element which has a structure•*

* Sec *Summa Theol.*, q. 51, a. I. St. Thomas makes a distinction between the dimension proper to quality (in this sense, we speak of structures which are more or less complex) and the dimension of its realization in a subject (a vegetable has a specific structure which is realized in varying degrees). According to him, there is a first classification of these realities, which arises from the fact that they are defined by a relation to a term towards which they are oriented : thus a movement, more or less intense, keeps its specific character provided it remains directed towards the same term. The other domain of intensity, that of the participation of a form in a subject, is extended so far that it embraces even substantial forms as they correspond to the dispositions of matter.

weaker than its period, has a short life span. There is an extreme variation in these periods going from fractions of a second to billions of years, for example, uranium. ”

2. Force. Here intensity is measured by certain effects of force. Thus one distinguishes the intensity of heat or electricity from their quantity. One evaluates the intensity in degrees of temperature or in amperes, and the quantity in calories or in coulombs. The definitions of intensity are furnished by the scientist in each one of these cases, and refer always to measures and to instruments. They are, therefore, variable, according to the progress of the laws and theories of science. Thus caloric intensity was first defined by the dilation of bodies (mercury, alcohol, air), and then by the deviation of a needle on a galvanometer. In any case, this conclusion is imposed : every force presents an intensity having multiple degrees.

3. By sensible qualities. Degrees are so well known that we need not tarry here. A color is more or less saturated, sound is more or less strong, a dish of food more or less seasoned.

The *second condition* is more difficult to verify. (Qualities will remain homogeneous in all their degrees). We think that a quality does not change kind while changing degree. La 3 remains La 3 even when it has become very feeble. But is it not our mind which, by abstraction, has established an illusory homogeneity between these totally diverse realities? We must recognize that diverse degrees of quality do not have the same individual reality. They are contrary to one another, and the higher degree excludes the lower. However, they preserve the same specific nature, revealed, no doubt, by the abstraction of the mind, but not created by it. The specific unity of the degrees allows us to recognize its reality in the movement which links the two degrees. Thus the biological form defined by the relationships of organs is made more precise with the development of the living tiling, which arrives at a certain peak and then falls back again.

“ The period for an element is the time at the end of which half of the nuclei present at the beginning have disintegrated. At the end of a time equal to 10 times the period, there remains only one active nucleus for every thousand present at the beginning.

Thus force defined by its direction is incorporated into a movement endowed with varying accelerations (gravity is greater at the pole than at the equator; a stone thrown into the air slows down as it ascends, and then falls back going faster and faster as it descends). Color defined by a wave length and a frequency, possesses a brightness which is diminished bit by bit in the degree and measure that it is propagated. The same is true of sound. In all these cases, the homogeneity of the qualitative degrees is shown as real through the reality of movement, which gathers them together in the unity of its succession. Thus the specific homogeneity of a quality remains intact in all its degrees, not only as far as the mind is concerned, but also in reality itself.

Couldn't this be a pure sensory appearance, a simple psychological impression of unity among qualitative degrees which are different? No. It is necessary to admit a real reason for this diversity as well as for this unity, and the reason can only be a diversity of degrees taking place in the same kind of quality. The homogeneity thus assured to the degrees of sensible qualities cannot fail to be true "a fortiori" about the degrees in forces and in structures, which are objects of scientific experience free from the illusions of empiricism.

In this affirmation of the variable intensity of the same quality, we see joined here, in order to explore the real, both the intelligence which distinguishes the *homogeneous*, the identical, and concrete experience which perceives *diversity*, succession, and which also gives an opportunity for reason to grasp the *order* from within that succession, the *orientation of change towards* a maximum.

The third condition is sufficiently established by examples already analyzed. (Degrees will not be simultaneous juxtaposable parts, but the complete quality such as it is at a given moment). The degrees of intensity are not juxtaposed. They exclude one another, as successive moments are excluded in movement. Each realized quality, identical to its intensity of the moment, is not juxtaposed to the intensity of the preceding moment nor added another quality; it becomes simply a higher degree when its intensity increases. It changes degrees without

changing kind, and it changes according to its nature which is simplicity and not juxtaposition of parts.

We can see that the intensity of a quality finds its real meaning in a qualitative change. Its problem then, is transposed into that of movement. From now on we will see that to measure an intensity is to measure a movement, and that the dimension of quality is nothing other than the dimension of a movement which corresponds to it. Thus the two preceding objections (D) receive their first answer. "

F. The union of quality with extension allows us to give a further precision to this answer. Corporeal quality is actually and essentially a determination of extension. The general reason for this is that a body is first of all extended, and an unextended reality has nothing to do with the corporeal. Therefore quality is an attribute of a body only on condition that it determines its extension. In more detail : (1) *figure* is a system of relations of measure which link the diverse parts of an extension with its limits; (2) *corporeal force* can be defined only by relation to an acceleration, it supposes local movement and extension; (3) as regards *sensible qualities*, either they are given as qualities of an extension (as is the case with colors and tactile qualities), or they are linked with the extension of the organs which perceive them (as is the case in sounds, tastes and odors) : our ears vibrate, our tongues taste a savory surface, and our nasal mucous comes in contact with an odorous surface.

Quality determines extension therefore to be more or less large. By it extension possesses a new dimension. Thus the quantity of heat in a gallon of boiling water is four times greater than that in a quart. The quantity of electricity in two identical batteries is double that of each battery. The quantity of light received by a plant is proportionate to the surface of its leaves. This new dimension of quality is added to its intensity, and makes quality measurable under a new title without, however, identifying it with extension in its basic nature.

** See *Summa Theol.*, I-II®, q. 52, a. x and 2. St. Thomas shows that intensity does not increase by addition nor diminish by subtraction, but by more or less perfect participation.

G. The distinction between quality and extension is imposed upon us for a number of reasons, and we are obliged now to refute the system called mechanism.

It was mechanism which was among the first to recognize this opposition. It denied the reality of qualities and affirmed that of extension.

In vindicating the reality of qualities, we are, however, urged by mechanism to reduce this reality to that of extension and movement. Moreover, in its thought, mechanism treats movement as something purely geometric, in no way qualitative, and reduces it to a mathematical formula. We shall criticize it on this last point (Cf. Third Question, second part). It will be sufficient here to indicate the opposition which makes quality irreducibly distinct from extension.

1. First of all, extension is formed of multiple parts; quality is simple and indivisible. Extension is indeterminate and does not constitute kinds by itself; quality is determination, and is diversified in a multitude of kinds.

2. Moreover, extension and quality vary independently of one another.

a) Equal volumes have different weights. The same number of atoms corresponds to different properties, as has been shown in the cases of polymerism and isomerism : thus if one warms iodine vapor, the molecules first formed of 8 atoms simplify themselves and by stages, I_8 , I_4 , I_2 , one arrives at I , in such a way that the volume formed of 24 atoms of iodine is able to correspond to 5 different molecular structures. Thus all the isomères are formed of the same atoms and yet they possess properties that are specifically different, e.g., ethyl alcohol and ether-oxide methylete.

b) Inversely, unequal volumes can possess the same quality. An organism, which grows, increases its extension, and is able to keep the same structure, such as crystals do, e.g., marine salt. Whether the crystals are small or large, they possess the same cubic form and the same physical and chemical qualities. It is rather useless to continue with examples of this

reciprocal independence in regard to sensible qualities. Empirically the distinction of qualities from extension is incontestably evident.

H. The measure of qualities (supplementary question) nevertheless remains possible : (1) by reason of movement which links a quality or an intensity to another; (2) because of the presence of quality in a limited extension.

Actually every measure is reducible to a measure of length. Therefore quality, in order to be measurable, ought to modify extension in such a way that the parts of extension directly measured will have some equivalence in relation to this quality.

This condition is best realized when it is a question of the " quantity " of quality, e.g., heat. The unit or calory is arbitrarily defined, without doubt, but the numbers here express real relations, and they are proportionate to the numbers of molecules possessing the same degree of heat. The measure bears directly on extension, and it is the measure of an extension endowed with a determined degree of the quality under consideration, not the measure of the quality itself. We should understand that, although it does not measure the intensity, it certainly indicates it in an exact manner.

The intensity of a quality is measurable in its increasing and decreasing movements, provided it is linked with a certain displacement in space. Thus temperature is measured by reason of the dilation and contraction of mercury, which involves its " rising " and " falling. " These words have a direct reference to the thermometer. Directly it is length which is appraised in this measure, and beyond the actual displacement of mercury, the validity of this measure must appeal to the principle of sufficient reason to establish its balance for the variation of the caloric intensity. * Strictly speaking, intensity is not measured. A double intensity is not the total of two equal intensities.

" The dimension of an effect which is directly measurable is an indirect measure of the dimension of its cause.

It is not formed of parts which can be added together. Moreover, successive degrees of intensity are not identical among themselves and cannot be taken as equivalents. A warmth of 10° is another thing than 50° .³³ Briefly, intensity is not measurable. The laws of the measurable, that is, the equivalency of parts and their capability of being added, do not involve intensity.

Thus those varying kinds of instruments which have for a suffix "meter," serve us by indicating equal intensities and by measuring either an extension determined by the intensity itself, or the displacements in extension which are linked causally to the variation of intensity. "To measure" a quality is, therefore, either to measure the extension it determines (its quantity), or to measure the displacement in extension which corresponds with it (its intensity). It is never to measure quality itself.

It is interesting to remark here that extension is not measurable by itself alone. It is qualified extension (limited extension) which is measurable. These measures reveal the twofold character of bodies, quantitative and qualitative, at the same time. The mathematical physical sciences thus bear witness to our philosophical inquiry.

Conclusions. Corporeal quality can be defined as : the *determination of extension*. We can actually deduce from this characteristic the other attributes of quality : to determine, it ought to constitute a multitude of distinct kinds; being determined, it cannot consequently change without ceasing to be, and is, therefore, simple, indivisible; but extension, indifferent to its determinations, can pass from one to another, and this passage from one degree to another in the same quality confers on each degree a certain intensity. Thus heterogeneity, simplicity, and intensity distributed in degrees, are the consequences of the determined and determining character of quality. The three groups of qualities realize this in their own way : figure determines the extension of the body considered in itself; forces

•• The chemical and especially the biological effects of these temperatures show that they are not concretely equivalent.

determine it in relation to other bodies under the aspect of movement; sensible qualities in relation to the sensory knowledge of man.

But the study of quality is still incomplete, since movement, because of its complexity, merits a study by itself. In this study extension and quality will be found again, but the phenomenon embraces new and original relations, and has a very revealing role to play in the knowing of a corporeal substance.

Third Question : What is corporeal *change*?

Third Thesis : Corporeal movement is :

1. *continuous and infinitely divisible*;
2. *qualitative and simple*;
3. and well described as : *the act of a being in potency, as it is in potency*.

A. Notion

1. *Common sense* sees in change a datum common to all sensations, both internal and external. This datum is that of diversity in succession, that of newness. The same sense, perceiving in successive movements, perceives differently. What gives a body another sensible quality — that is change : “*Id quo corpus fit aliter dispositum ac erat*” (that by which a body is disposed to be other than it was). Three kinds of change are discernible : (1) local movement or transfer : I go to New York; (2) qualitative variations: the sky darkens, water freezes; here we must add growth : the wheat ripens, the vine flourishes; (3) substantial change: coal is turned into cinders, the tree dies. In all these cases movement is, at the same time, a succession of states, an opposition between these states, and a dependence of these states on one another.

2. *Science* uses the abstract notion of local movement. It studies it in itself, and we have the science of kinematics, or as it is linked to force, we have dynamics. It applies its

abstract knowledge of movement to experimental studies and thus we have physics, chemistry, biology and astronomy.³⁰

Movement or quantity of movement is equal to the mass times the velocity : $m \times v$; v is expressed by the quotient of the displacement by the time : $v = d/t$. In the mathematical sense, movement is not a succession, nor an opposition of states, nor a dependence linking them. It is a measure, a given dimension. The application of this notion to a physical reality can only measure it. Directly, this measure reveals nothing of the nature of movement. Bergson has even denied its usefulness, because it reveals movement only indirectly. This anti-mechanistic reaction seems excessive because scientific knowledge of movement is useful to us, and therefore it is not able to be completely false. Keeping in mind his critique, let us take care not to limit ourselves to the teachings of science, if we wish to penetrate the profound meaning of movement, but on the other hand, let us be careful that we interpret these notions correctly. We can mark here that, according to scientific analysis, movement supposes three conditions : *continuity* of a certain space covered by *successive duration*, which two conditions are implied in the notion of speed ($v = d/t$), as well as a dependence on that *qualitative element* which is symbolized in the notion, mass.

3. Let us analyze these notions *philosophically*, and we shall discover in all movement an aspect that is both empirical and scientific.

a. Two positive terms which limit it : one, the starting point, "terminus a quo," the other, the finishing point, "terminus ad quem. " "

"For the physicist, differing rays are movements forming a scale, whose degrees are determined by a wave length : cosmic rays (wave length 10^8 Å), gamma (10^{-10} Å) (10^{-10} Å), ultra violet (10^{-7} Å or 10^{-6} Å), luminous (from 0.4×10^{-7} Å to 0.8×10^{-7} Å); infra-red up to 300×10^{-7} Å); then, the Hertzian waves from 500×10^{-7} Å to 2×10^{-3} Å; finally, the undulations of low frequency, up to 7,000 km.

³⁰ The traditional expressions "starting point" and "finishing point" are apt to be very misleading in their English usage. They seem

b. A relation of contrariety between these two terms : one is positive and implies the privation of the other, as well as the possibility of this other.

c. A relation of succession : one is anterior, the other is posterior; movement is thus oriented, and, in the concrete, irreversible.

d. A relation of reciprocal dependence : the terminus a quo tends to the terminus ad quern, and the latter comes from the former.³⁸ This *passage* is completely essential to movement.

e. A permanent subject, the mobile, which, passing from one state to another, becomes. This movement is the becoming of a stable subject (e), which passes (d) from one state to another (a), which states are contrary (b) and are realized successively (c).

It is the nature of the terms which determines the different kinds of movements (or changes, since these two words are actually synonymous). (1) *Local movement* (transfer) is the passage from one place to another. (2) The *variation of volume* is the passage from a greater extension to a lesser one or vice versa. (3) *Qualitative change* is the passage from one quality to another which is contrary to it. This is called alteration.

to refer necessarily to a local movement, interposed between two immobile positions. This appearance is completely erroneous. There are other changes than those of displacement. There are also other motions, whose beginning or end we do not know, such as those of the planets and the stars and those of electrons in an atom. Finally, in the displacements, which begin and finish, such as those found in the movements of projectiles, vehicles and animals, the terms of the change are *not points in space* (the " here " and the " there ") indicating the extremities of the covered trajectory. They are *qualifications of the mobile*, localized here and localized there.

** We willingly admit that a previous state explains the following one. that water warming at 20° prepares, leads to and also explains a further temperature of 21°, yet what we fail to remark here is. that these 20° are attained only in a process of warming which tends to a beyond, towards 21°. Without this reference to 21°. it is evident that at 20° the water is no longer in action to be warmed, that change no longer exists. We must say that the future of change is more its cause than is its past : a partial translation of the axiom " *Finis est omnium causarum causa.* "

The passage from one degree of intensity to another in the same quality is called "intensio," and the passage which leads to the loss of a quality is designated as "remissio." (4) *Generation and corruption*, which are correlative, are the passage from one substance to another, wherein one individual existence becomes another individual existence, whether of the same specific nature, as in the generation of a living thing, or not of the same specific nature, as is the case in atomic disintegration, and in the formation of chemical compounds.

B. The reality of movement is admitted by *common sense*, which distinguishes many kinds of it, yet, at the same time, common sense recognizes, side by side with movement, things which are stable. It ignores that which is of no interest to the conduct of human affairs. *Science*, however, indicates movement in those realities which appear to common sense as the most immobile : the atom is made up of electrons in constant and extremely rapid motion; the universe is made up of nebulae in constant motion. Science, in its analysis, tends to reduce all motion to local motions, and in every change seeks to analyze it under the aspect of local motion. Thus physics reduces the phenomena of dilation and contraction to local movement. However, the biological sciences will not go all the way with physics, and they point out the originality of the phenomena of growth : the living thing grows not only in increasing its volume, but in the differentiating and gradual realizing of its own structure; the movement of quantitative increase here is paralleled by a qualitative modification which leads the structure to its completion. Here local movement is only the condition of differentiation ; it is not identical with it. Chemistry places a new obstacle to complete mechanism by its distinction between chemical mixtures and chemical compounds. The clearest sense of this distinction is to place mixtures in the category of local movements without any true alterations, and compounds among alterations which have sometimes been called substantial changes. As for biology, every reproduction, every death appears as a profound change which might be characterized as substantial.

Philosophers are far from being so affirmative.

1. *The reasons for denying* the reality, whether of change in general, or of a particular kind of change, are varied : here are some of the principal ones.

a. For Parmenides, *all movement* is impossible. *Being* is necessarily *unique*. A second being distinct from a first would have to possess some character which the first lacked, but a being is not able to be limited by a lack of being, i.e., by nothing; being can only be being, without limitation, without possible distinction, without the possibility of an anti-being. The absolute uniqueness of being entails absolute immobility, since change always supposes a diversity of qualities and succession.

b. *Local movement*

1) is *impossible* according to Zeno, who bases this contention on four well-known arguments :

a) The dichotomy. A mobile object must cover an infinite number of intervals to arrive at the term of its movement, but it could never reach the term of its movement without at least covering half the distance, but then how would one cover half the distance with an infinite number of intervals?

b) Achilles would never be able to catch the tortoise, who is a step ahead, for while Achilles was advancing one step, the tortoise would still be advancing, and an infinity of points would still separate them.

c) An arrow flying towards its target would be in movement and at rest at the same time, for at each moment of its flight, it would be at one point of its trajectory, and therefore immobile.

d) The race course demonstrates that, if we admit the movement of two runners starting from two opposite points, running equal distances with the same speed towards a line which separates them in the middle of the course, we must also admit that each, at the same time, has covered the distance which separated him from the line in the middle of the course, as, well as that which separated him from his competitor, which

is double the first distance. In a second form, the argument attempts to prove that with the hypothesis of movement, two moments would be equal to three. The two runners run the course from opposite directions in such a way that they leave and arrive together, which determines two moments, yet they passed each other, and this determines a third moment.

2) Kant *suspects local movement*. The perception of it is dependent on *space* and *time*, but time is for internal sensations what space is for external sensations, an a priori form of sensory knowledge. We can be aware of phenomena only by placing them in an order wherein some are anterior to others and some posterior to others. We can not know whether the thing-in-itself is mobile or not. The main reason for this assertion is that the notion of time which is the foundation of universal and necessary mathematical judgments ought to have a necessary and universal value, but this is impossible, unless it is independent of experience, an "a priori" furnished by the subject knowing.

c. For the phenomenals, *substantial changes* no more exist than do substances; only phenomena exist, whether they be psychological or mechanical. If they reduce all reality to psychological phenomena, they are also idealists, as is the case with Hamelin. For him change is purely phenomenal in this sense, that it is ideas which change in our consciousness, and evolve from contrary to contrary to constitute the total object of our knowledge.

2. *The examination of these reasons* brings up ontology, in a and c, as well as critique, in b. 2).

Ad a. *Perfect* being is necessarily unique. There can be only one Perfect. However, experience shows us the existence of a plurality of beings. These beings must be said to be *imperfect* because they are beings with limitations, and we must make an effort to understand this in ontology.

Admitting a lack of perfection in beings there is room for a hierarchy of beings, and, moreover, there arises the possibility of a new being coming from an anterior being which is in another degree of being. It was with the doctrine of "potency,"

incomplete being, that Aristotle was able to give a rational explanation of the existence of movement; and it is by the doctrine on the analogy of the degrees of being that the Scholastics show the possibility of becoming.

Ad b. 1) a) and b). Zeno supposes in his first two arguments that movement is divided in some way. The answer is easy : real movement is not divided. Bergson has fashioned an imaginary answer for Achilles : " I achieve a series of indivisible acts. The course I run is a series of these acts. Inasmuch as the series includes steps, you are able to distinguish parts in it. But you do not have the right to break up this series into units supposed by some other laws than the laws of movement, nor even to suppose that it is articulated in some other manner. To proceed, as Zeno does, is to suppose that the race can be arbitrarily broken down into the parts of a space covered — which is ultimately to confuse movement with immobility." (*La Pensée et le Mouvant*, p. 182). We can add that it is to confuse abstract possibility with concrete reality.

Ad b. 1) c). The *arrow* is not at rest except at the extreme points of its movement. It does not tarry at any of the points of its trajectory, it only passes them. We can even safely say that there is no definite point in its trajectory. To determine points, to mark out possible or real stops for movement is to destroy actual movement by substituting for it a plurality of other possible movements covering the same extension. Here, again, movement is confused with the space covered, the possible with the actual.

Ad b. 1) d). The argument drawn from the *race course* develops as if the second runner were at the same time mobile (arriving at the line) and immobile (thought of as still at the starting point); or as if the movement had not, bit by bit, reduced his distance from the first by half the original distance. The second form of this argument supposes that there are indivisible units of time and space. This Pythagorean hypothesis is not true. The point of this argument is to show, and this is undoubtedly Zeno's intention, that the moment is no more part of duration than a point is part of a line : it is its limit.

Ad b. 2). The notion of time is not any more " a priori " than any other universal idea. It is formed by a mind which abstracts, which cannot construct except by means of abstraction. It is originally grasped in the data of differentiating sense powers as a relation of successive diversity. The universal and necessary character of mathematical judgments is derived precisely from abstraction, and their applicability to things arises from the concrete presence of the abstract in the very heart of things.

Ad c. Psychological phenomena alone exist : this is the pure postulate upon which idealism rests — a postulate of pure immanence. It consists essentially in a perversion of the notion of truth, wherein, instead of being an agreement of the mind with its real object, it becomes the agreement of thought with itself. It is impossible that only phenomena should exist, because there must necessarily be unified centers, as well as permanent and productive centers for the phenomena; in a word, there must be substances. It is substance which allows itself to be known in phenomena, as the " ego " allows itself to be grasped in successive psychological states. If there are substances, then substantial changes are possible.

3. *The positive proofs for the reality of movement*

a. are easy as far as *changes of place, extension and quality* are concerned. The same arguments which prove the reality of extension and qualities, also prove the reality of local movement and alteration.

1) Movement contains intuitive data. Becoming, is a relation wherein there is a *passage* from one thing to another (diversity) according to a before and after (succession). Moreover, diversity and succession are simple as well as intuitive data. Yet " becoming " is not constructed from their union; it supposes them and adds to them a new and simple relation which is properly " change. "

2) Science reduces a host of qualities to local movement, yet the reality of the defined movements so necessary to its truth, rests on the same evidence as the reality of qualities.

3) Our adaptation to the world is achieved primarily through our movements, whether faced by immobile or mobile objects. The same is true of animals whether they are the hunters or the hunted.

b. To show the *existence of substantial changes*, however, a special analysis is required. (1) The necessary and sufficient condition of a substantial change in the corporeal world is that an extended reality loses its existence in acquiring another. (2) But how does one state the distinction between individual existences? Existence is revealed by action, and action by the change produced. Existences are shown to be individually distinct, where the changes of which they are the first source exact distinct causes. Now the distinction of causes can be purely individual or individual and specific at the same time. The purely individual distinction is drawn most often because of a separation of quantitative limits and a certain independence in changes, e.g., two crystals of sea salt, a cat and a kitten. The specific distinction is drawn from a heterogeneity of permanent qualities which are called properties : Cl is distinct from Na, the dog from the serpent. (3) Thus we state that there is a plurality of kinds among bodies, each defined by a grouping of stable characteristics, and that each kind is realized in a multitude of bodies individually distinct. (4) But this plurality is only the condition of a substantial change : it makes it possible, it permits us to pose such change as a question. How shall we present this question of substantial change, whether it be a passage from one individual existence to another, or from one specific nature to another? Let us make the following distinctions :

1) *In the domain of life*, there is no doubt that an individual is born, another dies. Birth is not a creation : the materials preexist, but endowed with another type of existence. For example, two gametes have first been cells animated by the life of the parents : " an egg is formed, and here we have a new

* Our reference, here, is to the progressive formation of a grain of pollen (especially in the reproductive nucleus) starting with the mother cells of the anther, and that of the oosphere starting with that cell of the nucellus, which will become the mother cell of the embryonic sac.

existence which is manifested by a series of actions oriented to a new end.⁴⁰ Death is not an annihilation. The once-living materials remain, but devoid of the powers proper to living things, and devoid of the existence proper to living things.

2) In the *domain of biophysics*, wherein the exchanges between life and matter are operating, there is no doubt either. Vital assimilation gives life to alimentary materials,⁴¹ while disassimilation deprives living elements of their vital states. We must remark here that all "simple" bodies are thus able to be subordinated to life and later find again their independent existence. In a word, they have a nature which will allow substantial change.

3) *In the domain of chemistry*, the existence of substantial change is more difficult to explain fully. Three general cases appear clear :

First case: the formation of molecules from differing molecules.

a) Each *kind* of molecule is distinct from all other kinds by reason of stable properties which are opposed to the properties of other kinds of molecules. Their best known *physical properties* are : molecular formula and mass, boiling point and temperature of fusion, heat and electrical conductivity, system of crystallization, solubility in water or other solvents, their light and X-ray spectra. Their principal *chemical properties* are : acid, base or salt (Ph), affinity and diverse molecular function.

When, therefore, in a given content of matter in which certain kinds of molecules exist, a new kind or several new kinds

« We are thinking, here, of that prodigious activity of the egg which constructs an embryo from a grain of pollen and endows it with reserves at the expense of the mother plant, an activity so distinct from the life of seed-bearers, that life is broken even to the point of dying, as in annual and biennial plants.

⁴¹ Certainly this is not a case of simple digestion. This is a case of the fabrication of certain chemical composites of a very specific nature, which are very often structured among themselves in an equally specific way : for example, specific albumens, and especially chromosomic genes, chromosomes, nuclei and cells.

arise with the disappearance of the others, we must recognize a change in individual existence, and where there is a difference of kind, there can no longer be a question of individual identity.

b) The *manner in which a molecule is formed*, forces us to see in it something other than a mere aggregate, a mixture, or a simple addition of components. The precise laws of chemical combinations show the molecule as a whole, made up of *elements in necessary quantities*, as illustrated by the law of definite proportions in weight and volume, and the law of multiple proportions (Proust, Gay-Lussac, Dalton). In a chemical mixture, however, the relation between the weights of the bodies in the mixture is indefinitely variable.

Again, combination demands a *clearly determined transformation of energy*. This transformation is either exothermic or endothermic, and the decomposition of the same molecule is accompanied by an equal transformation in the opposite direction. This is not the case with mixtures.

c) The *way in which a molecule acts* shows real unity, since it functions as a single being. Thus osmotic pressure is measured in relation to molecular concentrations on one side or the other of a semi-permeable membrane. The pressure of a gas, at a given temperature, depends only on the number of molecules of gas present in a given volume. At the same temperature and under the same pressure, the number of molecules present in equal volumes of gas is *the same*, no matter what type of gas it may be (at 0° C. and a pressure of 76 cm. of mercury, a gram molecule of gas occupies 22.4 liters and contains 6.02×10^{23} molecules — the law of Avogadro).

The experiments of J. Perrin leave no doubt about the individual reality of the molecule from the scientific point of view. The unity of comportment or of action seems to indicate the unity of substantial existence.

Second case: The formation of atoms from other atoms or from simple particles appears more clearly as a case of substantial change.

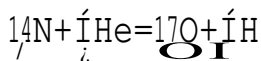
a) *Radioactive elements*, divided into 4 large families, disintegrate spontaneously (naturally, without any human intervention). For example, an atom of radium with a mass 226 emits :

(1) an Alpha particle, which is a nucleus of Helium (= one Helion) with a mass 4, and a positive charge of 2; (2) a Beta ray formed of negations; (3) a Gamma ray, similar to X-rays and composed of photons; leaving an atom of Radon with a mass 222 (nucleus) and a charge of 86.⁴²

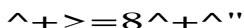
b) *Artificial disintegration* can be achieved with stable atoms (not radioactive). The process consists in hurling projectiles with tremendous energy against the nuclei of atoms in order to split the nuclei into their component parts. These projectiles are deuterons or neutrons from hydrogen nuclei, helium nuclei, neutrons, Gamma rays, and Beta electrons. Radioactive elements furnish us with them, and electric apparatuses accelerate them (cyclotrons).¹³

We can in a way construct and study numerous radioactive elements, which nature does not construct, or only constructs in infinitely small proportions, e.g., certain radioactive particles, and isotopes of ordinary elements (iodine, phosphorus, carbon, hydrogen, etc.).

c) *The formation of atoms* from lighter nuclei is made possible by the same process. In 1919, Rutherford bombarding nitrogen with Alpha particles obtained oxygen and an emission of protons :



In 1934, Joliot-Curie, employing the same process (bombarding nitrogen with Alpha rays), obtained fluorine and neutrons (their discovery) :



** See *Sourcebook on Atomic Energy*, pp. 133-137.

See *ibid.*, pp. 293-312.

According to Bethe, this reaction is analogous to that which originates solar light and heat : 4 nuclei of hydrogen are fused and transformed into one nucleus of helium, through catalytic action of carbon ejecting two positrons. The hydrogen bomb imitates this action. In both cases, the energy used to project these particles against each other is heat, with a temperature of over 10 million degrees. ⁴¹

How can we doubt that we have here a substantial change? When a reality changes its specific properties, how can it keep the same individual existence?

Third case: subatomic particles themselves seem very much to come into and go out of existence. The scientist says : they are created, they are annihilated. These terms must be taken in a relative sense. "Created" means that they do not preexist under a form in which our actual experience can grasp them; "annihilated" means they no longer exist with the determined characteristics which are given in actual experience.

"There were no electrons in nuclei, as we formerly believed," writes L. de Broglie, "and the positive and negative electrons emitted by nuclei of natural or artificial radioactive bodies (negative and positive Beta rays) are created when one of the nucleons in the nucleus changes its state." ⁴²

"A free *neutron* is radioactive. It will disintegrate spontaneously into a proton, an electron, and a neutrino... : its average life is about twenty minutes."

As to Gamma *photons* emitted in nuclear reactions, "we frequently observe that they disappear in giving birth to pairs of positive and negative electrons." (This is the creation of pairs or materialization). "The inverse phenomena of the disappearance of a pair with the formation of photons is called

⁴¹ See Jacob Sacks, *The Atomic Work* (New York : Ronald, 1956), PP- 85-87.

⁴² Translation into English of quotation taken from *Science et Vie*, n- 396, p. 140.

annihilation.” These terms come from the appearance of a mass equal to 2, and from its disappearance, a photon having a mass that is almost nil.

The scientist, then, in the course of his experience, sees these particles born, which he calls elementary : (1) positive and negative electrons, photons; (2) protons and neutrons. In the first case it is mass which is transformed into energy or vice versa. In the second case, it is the electric charge which is disassociated from the mass : a proton becomes a neutron and emits a positron, or a neutron becomes a proton in emitting a negatron.

Here we are forced to recognize a substantial change, and we are in some way guided towards that mysterious reality called by Aristotle prime matter, by virtue of that undetermined something which is neither mass, since it can only be energy (in the photon), nor energy, since it can only be mass (in the neutron), and which, nevertheless, is so real that it is that which remains basically through the most radical changes in nature.

The first two cases, however, are open to an *objection*. Here it is. In the formation of molecules or of atoms, we do not observe a profound newness. The constitutive particles, atoms in the first case, subatomic particles in the second, exist in advance with their properties (mass, electrical charge, structure). The energy itself which binds them together preexists : neither molecular combination nor disintegration creates one parcel of it. The only new thing is the assembly of parts. And what more is this assembly than the result of *local movement*? Moreover, in a world dominated by the principle of the conservation of mass and energy, what can be substantially new?

It is true that the general quantitative expression of phenomena can tell us nothing about substantial change, because the latter is situated in the *individual*, and is appreciated only

“ Further English translations from *L'Age Atomique*, pp. 34-36. and *Lumière et Vie*, Sept., 1954. p. 29.

in a *qualitative manner*. From a general and quantitative aspect, my birth and death change nothing in the total of mass and cosmic energy.

Let us proceed then to the individual. A molecule (such as OH₂), an atom (such as Radon) did not exist earlier. Now, here they are. Are they the results of a local movement? Certainly: H and O are bound together now; Ra has lost 4 nucleons. The death of this frog which I have just decapitated is the result of local movement, but this does not prevent the presence of a substantial change. This is a question of our appreciation of the results of a local movement. Now here in a composite there are : a) non additive properties, which are discontinuous in relation to the components; b) a necessary unity in the composite in which the individuality of the components is effaced.

a) *Non-additive properties* are discontinuous. A molecule is not an aggregate in which its properties are merely the sum total of the properties of its components, e.g., H and O. Certain properties called additive, such as mass, are pretty nearly the sum total of the properties of the components. But the majority of properties in a molecule indicate a *discontinuity* between it and its components : thus an ordinary molecule of hydrogen, formed from 2 atoms (H₂), has a specific heat of 4.8 calories, whereas separately, each atom has a specific heat of 8 calories.

The same is true of atoms in relation to their constituent particles. With the exception of mass, which here again is an additive property, almost all the properties oppose the atom to the properties of its component particles. Its unity, so strong that for a century we believed it absolute, is opposed to the complexity of its components. Its electrical neutrality is opposed to the charge which characterizes its protons and negatrons; its definite and more or less stable structure, to the possible scattering of its particles. It has *its own* volume, *its own* proper light and X-ray spectrum, *its own* specific chemical activity, none of which is found in its isolated particles.

b) *Necessary unity*. Molecules compared to their component atoms, atoms compared to their component particles.

possess an independent behavior and action which is opposed to being subordinated to that of their components. Scientific language insists on recognizing what persists in change, rather than indicating what is different in these movements. However :

- (1) It points out the subordinated state of an electron integrated in an atom.
 - (a) The electron depends on the nucleus (Rutherford), contrary to the traveling electron in form of a cathode ray;
 - (b) In order to spread its energy (light or X-rays), it depends on its level of energy within the atom (Bohr);”
 - (c) It depends on other electrons in the same level : “ Two electrons occupying the same level of space are never found in the same state ” (exclusion principle of Pauli). “ When one electron is in a certain state of movement, no other particle belonging to the *same* system can be found in the same state. ” 48

(2) According to combinatory laws and those of nuclear reaction, the molecule and the atom undoubtedly appear as complex realities, and the different regions of their proper extension are shown as endowed with diverse properties. However, molecules and atoms also manifest themselves especially as determined structures, whose parts are distributed as to number, mass and activity, by necessary relations, and united, moreover, through tremendous amounts of energy (measured by the heat in the formation of a molecule, and the loss of mass in the nucleons forming a nucleus).

Conclusions. Without prejudging the intimate nature of substantial change, we have limited the problem to that of a change in which one same extension exists successively with two different individual existences, or even in two different

See *Sourcebook of Atomic Energy*, ed. by S. Glasstone, pp. 93-108.
« *Ibid.*, pp. 108-113.

kinds of existence. We draw the conclusion that substantial change is real, not only among living things, but even among minerals as well. Otherwise the passage which goes on incessantly between these two groups would be unintelligible, if mineral elements were not able to change their individual existences. On the other hand, it permits us to conceive positively in what specific change ought to consist. When a living acid is produced by the digestion and assimilated by a living cell, it is not annihilated, nor does it continue to exist as heretofore.

Experiment shows that it certainly keeps many of its properties and is still able to be *represented* as before by the same molecular formula, yet it loses its molecular, mineral existence, and acquires a very different individual existence, an existence which is a life, the life of this individual who has just assimilated it. The same is true for atoms of C, of O, of H, and of N, although in certain ways they keep their properties when they become living things.

There is no need for postulating a specific mutation in the mineral world, i.e., the absolute disappearance of former specific characteristics. What specific substantial change demands is the appearance of specific characteristics which are really new.

It appears, then, that substantial change ought to be affirmed : (1) in a passage from *living to non-living*, whether absolute (birth and death) or relative (assimilation, disassimilation); (2) in the *three domains of the mineral world*: molecules (chemical reactions), atoms (nuclear reactions), and subatomic particles ("creation" and "annihilation," loss and acquisition of electric charge by nucleons).

Are the formation of *crystals* and those of *colloids* substantial changes? It seems very doubtful. In regard to this subject, see : Thonnard, *Précis de Philosophie*, p. 137; C. Boyer, *Cursus Philosophiae*, Vol. I, p. 496; and Maquart, *Elementa Philosophiae* Vol. II, p. 120. They all answer affirmatively in regard to crystals.

Here we can pose the question of the atom ionized by the gain or loss of an electron. The change is of so little importance that we can compare it with a slight organic lesion; nothing indicates the loss of substantial individuality.

Thus, an electron changes substantially, when, after being free, it becomes a constitutive part of an atom even though it conserves its electric charge; the same is true of the atom which gains or loses a nucleon, or enters into new combinations with others; the molecule, when it is polymerized, when it is combined, when finally it becomes living through assimilation; protoplasm, when it dies; the cell, when, isolated from the mother cell, it leads an independent life.

C. The most fundamental characteristic of corporeal change is continuity. However, this continuity cannot be verified in all the senses of continuity, and therefore the original statement cannot be taken in an unqualified sense. Taken by themselves, qualitative changes, and especially substantial changes, are not continuous : substantial change must even be said to be essentially discontinuous. Yet we must say that the continuity of corporeal change has some *universal* meaning. (1) All corporeal change is linked to local movement, and (2) local movement is essentially continuous. Let us proceed to the demonstration of this.

1. *Local movement is continuous*, that is, formed of parts which do not have their proper limits; it follows then that it is divisible.

a. Actually, it is the passage from one place to another, the covering of a certain distance, and thus by essence it is *relative to extension*. Movement divides extension; it marks those limits which constitute its starting point, terminal point, and the limits which it traces with its trajectory. On the other hand, between those limits which are at the same time its own as well as that of the extension covered, movement has a dimension of its own, which corresponds with spatial dimension, except that it is realized successively rather than given all at once. The parts of extension demand correlative parts in

movement. If they are continuous, then those of movement are also. Moreover, every division of movement determines a corresponding division in extension ; if the parts of movement were not continuous among themselves, neither would those of extension be. But it is impossible that extension exist without any continuity. It is necessary, then, that movement should be a continuous dimension.

Undoubtedly, many movements can be made to follow each other either immediately or separated by intervals of immobility, as extended dimension can be made up of contiguous or distant parts. But even as there is no contiguity or distance without continuity, so there is no succession of movement, whether immediate or interrupted, without indivision in the simplest displacement. Bergson has strongly accented this indivision, this "necessity to link the diverse," as Hamelin describes it (*Essai*, p. 121). So strongly does Bergson insist on this theme, that he almost denies

b. the *divisibility* of local movement. " We will represent all movement and all change to ourselves as absolutely indivisible," writes Bergson (*La Pensée et le Mouvant*, p. 179). We can understand this formula if we place ourselves at the most concrete point of view, that of individual motion : every division destroys the notion of individual. But movement implies also a *reality which can be expressed abstractly*. Thus :

1) Science truly knows the world of movement, although it grasps local movement only under its universal aspects. It grasps movement only by measuring it; by measuring, it divides it; it divides, only in dividing the distance covered. The division of movement is possible because of the division of its trajectory, and its divisibility is as indefinite as that of extension.

2) Philosophy also studies movement and its general characteristics. The " passage from one place to another " is realized successively in a distance or space between two termini. In this space, which is indefinitely divisible, one can determine an indefinite multitude of positions, each of which is able to

be a starting point or a terminal point for a mobile object. Thus a movement, limited by two extremes, can be broken into as many movements as one wishes, each of which will remain continuous in itself and hence further divisible. The indefinite divisibility of local movement is a consequence of its continuity. Local movement is a *successive continuum*.

Objections :

a) Bergson may object here that only the trajectory is continuous and divisible, movement itself is simple. Divide the trajectory. Movement is not divided. It is suppressed and replaced by others which cover, at the most, the same extension. We could demonstrate, however, with the same kind of reasoning, that a straight line or a trajectory could not be divided into segments. To divide is always to destroy unity and substitute plurality for it. We can not divide anything into segments except on the condition of considering its individuality only as an abstract dimension. In the same way, then, every movement undoubtedly possesses an individuality which is not divisible. However, its continuity, its unity is that of a successive dimension realized in parts outside of parts in a distance covered ; for every real and possible division of the trajectory, there corresponds a real or possible division of movement. The indefinite divisibility of the trajectory has for a consequence the indefinite divisibility of movement.

b) But the objection persists : only the trajectory is divisible, because its parts are simultaneous, immobile; but since movement is entirely successive, it can not be divided. We may answer that it is not the simultaneity of parts, but their exteriority which make the trajectory divisible. Movement then can be divided despite its successive character; precisely because it is a passage, it is relative to all the parts contained in the trajectory, and, because of that, it is a whole made of continuous parts one anterior to another, yet divisible by reason of instants that are intermediary' to beginning and ending instants. Bergson has fortunately accented the unity of movement, but he transformed this unity of fact into an absolute. That was an error.

2. *AU corporeal change implies local movement.*

a. Qualitative change reveals itself to science as based upon local movement. 1. *Structures* change only by a correlative displacement of the limits of a body. 2. *Forces* are linked to local movement, and their variation cannot be produced without a variation in displacement. This can be summed up in the formula: $F = ma$, since the acceleration a supposes local movement and the other notion, mass, has no meaning except in relation to displacement. 3. *The sensible qualities* of excitants only affect the senses through the medium of an extensional contact of the object with the organs, and are transmitted only by a material influx running the length of the conducting fibers from peripheral organ to the cerebral center. Many other qualities suppose physical vibrations: colors, sounds, thermal qualities.

b. As to substantial changes, they are certainly in themselves indivisible and instantaneous, since there is no possible middle ground for an individual between being and non-being. But they are realized as terms of a qualitative alteration, and they must be considered as real movements breaking the continuity of local movements. Thus the atom disintegrates under the impact of particles endowed with tremendous speed; water decomposes if warmed to a temperature around 1500° C.; life ceases because of certain humoral modifications.

Thus all corporeal changes are based on local movement and possess a fundamental continuity which makes them in some way divisible. Thus a doctor may arrest a fatal disease, but this does not mean that the passage from life to death is divisible, but the movement which leads to this instantaneous term is continuous and may be arrested before it is attained.

D. The qualitative nature of movement and its simplicity were restored by Bergson, Leibniz and the dynamists generally. It cannot be said that this qualitative nature was misunderstood either by Aristotle or the Scholastics.

1. *That there is quality*

a. an alteration and in substantial change is beyond doubt. A change whether of quality or of substantial determination is evidently}' qualitative.

b. In local movement, quality is less apparent. It is found :

1) in the fleeting *localization* of the mobile in its act of being displaced. This determination is a superficial characteristic and carries with it no internal modification of the mobile object. It expresses only a spatial relation between the mobile and other bodies. Yet this relation is real, since it has for its foundation the relationships of contact and distance between the moving body and neighboring bodies. By the variation of these relationships, in which its movement consists, the mobile is modified in its possibility of acting and receiving influences. Localization is certainly a reality, and it is a determined, quantitative reality. Kinematics considers only successive localizations in movement, and though this point of view is as abstract as can be, it remains real, and even in this degree of abstraction, movement remains determined, qualitative.

2) in *force*, in that which triggers the movement, and in that other force which is interior to the mobile itself, which belongs to it by reason of its movement, and which is dependent on its own mass. We must actually admit that a body in movement possesses a determination in itself which it does not possess in a state of repose. This determination is expressed in the mechanical concept of kinetic energy ($\frac{1}{2} mv^2$).

3) finally, in the *passage*, which is the essence of movement. Only the abstract notion of this passage is undetermined. In its concrete reality it is always determined by its terms. The concrete reality of movement is that of an active tendency, of an orientation unfolding in a definite way towards a definite end. Moreover, the measure of movement is possible only if extension receives from movement those determinations upon which the notions of direction, vector, speed, acceleration and succession are based. From all these points of view the "passage" is determined and reveals its qualitative character.

2. The *simplicity* of movement is a consequence of this characteristic.

a. Every quality is actually simple.

b. The possible parts of movement are based on a single actual whole through a link proper to movement which is the passage itself, that is, movement in its purest originality. This link would not be able to unify if it were not simple.

c. Finally we must bear in mind the individual reality of movement. "Undoubtedly, while we are moving our hand from A to B, we may say to ourselves that we can stop it at any intermediary point, but this would no longer be the same movement. There is no longer a unique movement from A to B; there would be, by hypothesis, two movements, one terminating at the interval and another beginning there. If we allow our movement from A to B to remain what it is, we are aware of its indivision and the impossibility of its being divided" (*La Pensée et le Mouvant*, p. 179). Here on the plane of concrete, individual movement, Bergson is triumphant: every division of movement changes its individual reality; to divide it is to destroy it. Indivisible in its individuality, movement is therefore simple.

Objection. Nothing would be served by recalling to us that movement is measured and therefore divided, because one can not conclude from this that movement lacks simplicity. That which is qualitative in movement is simple, and especially its concrete unfolding in a moving individuality, which quickly vanishes never to return. But nothing prohibits us from considering it in an abstract way, although it is always real, nor from seeing in it the correlative of extension which it covers, or which it determines, which extension remains a successive divisible and continuous dimension.

E. The definition of change has to unite its two apparently contradictory aspects: continuity and indeterminate divisibility, on the one hand, and indivisible determinations on the other. The Elcatic criticism aided Aristotle in forming a description of movement which the moderns themselves recognize as being

very precise. Hamelin writes : " Change is certainly the progressive and continuous passage which he described."⁴⁹ It is " the act of a being in potency insofar as it is in potency. "

In this brief definition we find the following elements : (1) a perfection, the structure of which is already realized, e.g., the root of a plant; (2) a lack, the structure which must yet be realized ; (3) a real aptitude for acquiring the structure which is lacking.

Aristotle designates these three components by three terms : ACT, PRIVATION, POTENCY.⁵⁰

Thus *act* embraces every *determination*, every real *quality*, every *-positive perfection*. This term, therefore, designates more than psychological acts or external action.

A being in act is that *which possesses a determination*.

potency embraces every *real aptitude* for an act, i.e., for a determination. It is not being, but the *capability of being*.

A being in potency is one which *lacks* a particular act, i.e., a particular determination, which it is *capable* of possessing. Here we see how privation and potency are united.

In a change, then, such as the growing of a plant, there is supposed : (1) an act already present ; (2) an act not yet present (privation) yet really possible (potency). Change is itself an act, a perfection : the passage from a state wherein there is privation-potency to a state of act, relative to the act which is absent. It is thus the act of a being in potency, precisely as it is in potency.

1. Every corporeal change is *act*. It is a reality qualitatively defined (cf. demonstration in numbers 2 and 4).

2. It is the act of " *a being*, " that is, of a subject, of a mobile. Movement is realized in a body, it qualifies an extension, and this is sufficiently attested to by science. Every corporeal

* Translated quotation from Hamelin, *Système d'Aristote*.

⁵⁰ *Aristotle's Physics*, Bk. III, ch. I (*Basic Works of Aristotle*, edited by Richard P. McKeon [New York : Random, 1941])-

change involves local movement, and this latter is essentially the determination of one extension in relation to all other extensions, or to some other extension in particular. This is tantamount to saying that movement absolutely demands a subject. In no way can two contrary and successive terms be sufficient to constitute movement. To understand movement we must pose a special relation between those terms, "fieri," the becoming, which is precisely what movement is in its essence. What is it that becomes? It is not the anterior determination, the "terminus a quo," which becomes a later determination, the "terminus ad quern." Light does not become darkness, whiteness does not become obscurity; a determination can only be or not be; being simple, it ceases to be from the time one wishes to modify it. It is, therefore, impossible that there should be a real becoming, if successive determinations exist without a common support, without a subject. Becoming is real and is therefore the becoming of a subject.

objection : It is useless at this point to bring forward Bergson's analyses, the results of which are formulated in this statement : "Change has no need of a support. There are movements, but there is no inert, invariable object which is moved; movement does not imply a mobile."¹¹ These affirmations are directed against the Cartesian idea, that, under successive determinations, and absolutely indifferent to them, there is a perfectly immobile substance. The analysis of movement forces us to affirm that there is something more than successive determinations, namely a principle of continuity, a link which binds the anterior to the posterior, the past to the present, which projects the present into the future, which gives unity and interdependence to all moments of the same movement. Now it is precisely this affirmation upon which Bergson bases his analyses. He directs his criticism against mechanism^M and its conception of a purely passive and•*

* *La Pensif et le Mouvant*, p. 185

^M For Descartes, extension is the theater of movement. Extension does not contribute to it. Movement is foreign, indifferent to extension and does not truly change it.

unchangeable mobile. The support which we demand for movement is not unchangeable under successive determinations; it is changed by them, it collaborates in their reality, in their succession, and exists necessarily only under these conditions.

As for the analyses of Bergson, they show us directly, that external perception and consciousness are often mistaken in judging certain objects to be immobile, when a less subjective method can demonstrate them to be moving. "This seeming movement of a thing is really nothing more than a movement of movements." (*ibid.*, p. 187). These aforementioned analyses invite us not to let ourselves be deceived by formalism into separating the mobile from movement. However, nothing in them can prohibit our distinguishing the mobile from movement, nor from pointing out that the reality of the mobile is evidently more than the movements and successive determinations of its movement.

3. Actually, this mobile is not complete being, but a *being* "in -potency," in the technical sense of being "in a certain way an indetermined determinable." (1) A moved being, as long as its movement endures, *does not possess* all its determinations; (2) it is *capable of receiving them*; (3) its movement is communicated to it successively. The accuracy of this description is easily verified: (1) one determination at least is lacking to a being in movement, namely, that which it will have; moreover, in continuous movement, the mobile lacks the determination of all the subsequent and successive parts of its change; (2) its movement is precisely the gradual realization of its absent determinations; (3) finally, movement implies an orientation, a direction; it is an advance towards a definite term, towards an "act." The perfectibility which is supposed in movement is not any term, but relative to this term, to this precise act.⁵³

"In potency" does not have here the meaning of a "power of action," as in the expression, "io horsepower," or the "power of a tyrant." "In potency" can be understood as "potential," but on condition that we do not place under this term the idea of a "capability of action," as one might speak of "potential" energy.

4. Finally, this being (mobile) must be considered as a being *in potency*, in order to be thought of as in movement. Movement essentially implies a lack of perfection, the unfinished, the indetermined. It is only a passage to its "terminus ad quern."

conclusion : Corporeal movement is a *determination* of extension : it is act. But there is something unique in this determination, it is *successive*. Each degree remains relatively indetermined and determinable since it leads to the next degree. It is act, but the act of a being in potency.

F. The reality of potency is a conclusion drawn from the reality and nature of movement. Movement exists only in a being having potency : it is the actuation of a potency, that is, an advance towards an act which is correlative to the potency specified by this act. To deny the reality of potency is to deny the existence of change. But how can we conceive this potency? Only as a relation to act. M

1. In the first sense potency is a *privation of* act, and is synonymous with that which is *possible*, since an absolute privation of act would be equivalent to nothing. Thus the state of potency is indétermination, the privation of any specific act.

2. In the second sense it is a *real possibility* of act. A being in potency is a being which is in some way determinable. Potency is not completely identified with logical possibility and especially in this second sense, where we are concerned with more than the absence of contradiction. Here potency is a reality, oriented towards a precise determination, a definite receptivity, as opposed to a general one, a possibility anchored in the very heart of the real. *A blind man does not have the power of seeing; even in darkness, a man with sight has that power. Water, which is a liquid at normal pressure, cannot remain so beyond 100° C. while oil and lead can. Sound cannot propagate itself in a void and light can.*

M Potentia dicitur " ad actum.

3. Potency is a *tendency* to act, not in the psychological sense, but in the sense of an ontological necessity. It is essentially correlative to act, and it is through the act towards which it is oriented, that it is specified and knowable.

G. A moved being is therefore a real being *composed of act and potency*. It is such because its movement is at the same time act and potency.

a mobile being, even in the state of repose, before all movement, is already a real composite of act and potency. Because it exists it already possesses certain determinations, certain acts. But since it is mobile, it possesses also this determinable indetermination because of an act still absent, hence the justification of the technical name of potency.

At the end of this inquiry on the corporeal attributes, we can sum up the following conclusions :

1. These attributes are real. Extension, qualities, and movement are imposed on us : they are the intuitive data of our sensations. Their reality is the condition of the truth of sciences which concern themselves with the corporeal world, and also the condition for the biological validity of our empirical knowledge.

2. Bodies in general and each body in particular possess two irreducible properties, extension and qualitative determination. Moreover, each body being subject to change is made up of two real principles, potency and act.

These statements must seem strange to the reflective mind.

a. Each body is endowed with unity. It is an individual, and we say that it is irreducibly double, made up of extension and quality.

b. Each body exists, and yet we say it changes even in its individual existence. If it is able not to exist, how explain that it exists; if it exists, how explain that it can no longer

M Potentia specificatur per actum.

exist? One can understand how that which is, may be, and how that which is not, may not be; but how understand that which is, may no longer be, and that which is not, may one day be?

Thus two questions must be posed :

1) What constitutes the individual unity of each body? What is its nature?

2) How is *substantial change* 'Possible'? What are its causes? The nature of bodies undoubtedly make this change possible, but what makes it an actuality?

Certain philosophers would like simply to dismiss these problems. *Some of them* suppress these questions : either they deny the reality of extension, of qualities and of movements (various shades of absolute idealism), or they deny the existence of substantial change, and at the same time, the irreducibility of quality and quantity, such as the mechanists, who reduce quality to quantity, and the dynamists, who are forced to construct quantity out of quality.

Others declare these questions to be insoluble. Thus Kant refuses to accept any " theoretical " or demonstrable knowledge of the substance of things.

As for us, we must accept these problems as inescapable. We must attempt to resolve them " theoretically, " as this is the only way to show that the problems are soluble.

CHAPTER II

NATURE AND CAUSES OF THE EXISTENCE
OF BODIES

Fourth Question : What is corporeal *substance*?

Fourth Thesis : Corporeal substance is

1. *not extension in local movement*, against the mechanists,
2. *nor an unextended force*, against the dynamists,
3. but an *essence composed* of potency and act, that is *prime matter and substantial form*.

A. Notion

1. According to *common sense* understanding, substance designates the most important, the most characteristic element of things. The expression "in substance" refers briefly to the essential. Often it means the most hidden part of things or the most durable part of things, e.g., my substance remains identical in all the stages of my life. In other words, it is substance that we think of in relation to even' *permanent object of perception*. Each thing is then a substance; it is substance we think of in the *substantive* use of words and principally what we understand by a *subject* in propositions. In every judgment the subject is conceived in the manner of a substance.

At this stage of knowledge substance is defined :

a. as *an individual endowed with a real existence (or itself)*. The object perceived is substance in this sense : individual, because it is given in a spatio-temporal experience; endowed with real existence, because it is imposed on my sensation and acts on my senses; existing for itself, because it remains active, independent of my perception, and constitutes an indefinite possibility of sensation, c.g., this tree.

b. as *a universal endowed with a specific nature*. The subject is substantive; it places before the mind in its specific characteristics what is placed before the senses in its individual characteristics, e.g., a tree.

c. in both cases, as an *absolute reality*, determinable by attributes completely relative to it. Thus, water, which has just been boiled, grows cold again; water, no matter where, is liquid. In the first case, the object is perceived for itself as an independent whole; in the second, the subject of judgment is posed before the mind for itself; it is not related to another idea, since there is something in it which is opposed to the attribute.

2. *Science* constantly uses this notion of substance, although the mathematical method tends to eliminate it. Even chemistry continues to use the word in its abstract sense. For it, substance is a chemically pure body, defined by specific properties, which are stable and belong to a number of bodies of the same kind, and which characterize these bodies to the exclusion of every other kind. Biology studies concrete substance, but designates it by other terms : an individual, a living thing, a vegetable, an animal. Its recognition of substance, however, is no different than above, a group of specific characteristics.

3. But it is the business of the *philosopher* to give a precision to this notion, which all, whether learned or unlearned, without any special analysis, can use regularly in their thought. The Thomistic definition of substance is : *essentia cui debetur esse in se et non in alio* (an essence to whom existence is owed in itself and not in another). Thus it is an essence whose

proper mode of existence is to exist in itself (to subsist), i.e., for itself, and not simply as a determination of something else.⁶⁶ On the other hand an essence whose proper mode of existence is to exist in another, i.e., as a determination of a thing other than itself, is an accident. Substance belongs to itself, an accident belongs to the substance; substance exists in an absolute manner, while an accident exists in a way that is completely relative to the substance. Common examples suffice to illustrate this definition: water is successively cold and hot; Socrates is sitting, then standing, he walks, now he stops. Water and Socrates are substances; cold, heat, attitude, movement, and the rest are accidents.

The analysis of this notion reveals two equally positive aspects:

a. *Existence for itself.* It belongs to an individual and to it alone. The universal is not able to exist for itself. If it did, it would be individual for that very reason: Aristotle has established this against Plato.⁴⁷ Nor can an accident exist for itself without ceasing to be an accident, for it exists only as a determination of some subject already existing. Hence we must distinguish the notion of substance and logical essence.^{a*} Essence can be the essence of substance or of an accident; it is always, logically speaking, universal; substance, on the contrary, is opposed to accident and it is individual.

b. *An essence capable of existing for itself,* i.e., whose characteristics are absolute. It is an essence which can not determine another, whereas the essence which can and must determine another is an accident. This is an individual essence. The universal belongs to the individual and not to itself. It must be remarked, however, that I do not know what individualizes essence, and that I am forced to consider individual

⁶⁶ See L. De Raeymaeker, *Philosophy of Being*, pp. 173-X77.

« Aristotle's *Metaphysics*, Bk. I, ch. 9, 990^a23 to 991a, S.

M Essence, in the absolute sense: something which is or is able to be or at least which can be thought. *The essence of a being: that which this being is*, that which defines it. Thus the logical essence = definition.

essence under universal characteristics.*' But the "direct universal" does not represent, at least to my intelligence, the real individual, the real substance. When, for example, I assert: "Man is at the same time corporeal and spiritual," I am not thinking primarily of the species as such, but of each individual who realizes this notion. "Man" refers to a substance, despite its common "vestment." Thus the conclusion is borne in on me that I think of a substantial essence only under specific characteristics belonging to all the individuals of the same group and to each one of them. Because of this we see that a specific distinction is one of the two ways of distinguishing substances.

The *knowability* of substance. From this analysis the following result emerges: if substance by itself constitutes all of reality, then it is incapable of communicating knowledge of itself, for substance is that which exists for itself. It can, however, reveal itself if it is the cause of determinations relative to itself, i.e., accidents, which, since they do not exist for themselves, are able in some way to exist for me as well as for substance. •'

How can I, then, be sure that there are corporeal substances? By examining whether phenomena (the objects of experience) oblige me to see an absolute in them, and certainly distinct from them, but involved with them because of their real character. I would say that a substance is present where**

** Thus "this man" designates an individual to me, but it makes me know him only through a characteristic which belongs to many others as well as him, a universal character. It is "man."

M The "direct universal" designates the comprehension of the universal idea, i.e., its meaning (as it is able to be attributed to different individuals taken one by one).

"Kant seems to have envisaged substance in this way, when he used the term, "thing-in-itself." To say that the "thing-in-itself" is unknowable for me is a truism of the most banal sort. Yet there still remains the question of knowing whether such "things-in-themselves," exist walled up in their substantial isolation. Could there not be a tiling which, while being truly in itself, could also be linked completely to a world of other things in themselves? Experience makes the question unnecessary, even as it answers the monistic legislating of Parmenides on the absolute unity of being.

multiple phenomena possess a real *unity*, where successive or changing phenomena reflect a *permanent and durable source*, and finally where phenomena of the same kind demand a *specific internal cause*. I would further make a distinction between two planes of reality at the heart of the phenomena which appear: the plane of substance, which is fundamental and absolute; and the plane of accidents, which is built on the first and completely relative to it. The first plane is endowed with a higher reality by its unity, stability, and activity.

B. The reality of corporeal substances can now be affirmed. The certitude of this affirmation is one of *empirical* knowledge, as well as a constant implication in the branches of *scientific* knowledge.⁶² But it needs to be a controlled *philosophical* certitude, for if corporeal substance is a myth, the metaphysical study of bodies is finished; but if it is a reality, we must further determine what it is.

The *phenomenalism* of Hume (18th century), and of the *Positivists* (Auguste Comte, Taine in the 19th Century) admits only the reality of phenomena. They assert that the notions of substance and of cause are simply psychological illusions, and the problems to which they give rise are pseudo-problems. Reality, they say, must be verified, being by definition the object of experience; consequently only phenomena are real. “

The *critique* of Kant, on the other hand, makes substance an “a priori” category of the understanding, without any objective value for the thing-in-itself.⁶³

To show that the notions of substance and of cause express the real is a problem for the critique of knowledge (examination of first principles), and for ontology (the study of being and its causes). It will suffice here to indicate that the demands of Hume are manifestly excessive. All that is necessary to

** Science supposes the concept of thing, namely, substance. See A. G. van Melsen, *Philosophy of Nature* (Pittsburgh: Duquesne U. P.), p. 9.

⁶² Charles A. Hart, *Thomistic Metaphysics*, pp. 195-196; De Raeymaeker, *Philosophy of Being*, pp. 189-190.

⁶³ See Charles A. Hart, *Thomistic Metaphysics*, pp. 197-198-

recognize the reality of substance is to establish the permanent existence of an unchangeable reality in experience. "If an impression," says Hume, * gives rise to the idea of a me (substance), it ought to continue as invariably the same throughout the whole course of my life, since it is thus that the me (substance) is supposed to exist." We agree that to think of a substance as a pure thing in itself, is ultimately to be led to the denial of its reality. This is a misconception of substance, for substance is deeply involved in a host of qualities and changes. The main task is to find in experience the intuitive data which constitute the essence of these notions. Let us limit our efforts to the recognition of the reality of corporeal substance; this will be a beginning and first stage to the solution of the problem of critique. We will admit the reality of phenomena, which only the skeptics will doubt. Moreover, it will be sufficient for us, that among phenomena, the reality of extension, qualities and change be accepted.

1. Let us first consider phenomena *in their concrete reality*. Substance is found in them, and analysis will discover it there as the source of their unity, their duration and activity.

a. *Phenomena have unity* despite their obvious multiplicity. The actual indivision of the durations, and of the successive positions of a movement, the compénétration of the most varied qualities in the very heart of the same extension; the continuity which intimately welds the parts of a volume from within to a common surface, despite the exteriority of these parts; and the complete union which fuses durations, positions, movements, qualities, extension and figures in the individual objects of empirical perception (things) and in the objects of science as well (molecules, atoms, electrons), lend force to our original assertion on unity.

b. *They have a permanence*, a stability in their successive unfolding, a permanence of individuality throughout local changes and qualitative alterations, a permanence of specific characteristics in the middle of transitory phenomena. The study of change shows us the necessity of admitting a stable subject underlying successive determinations.

c. *They have an activity* at the very source of their passivity, an activity which links antecedents to consequents, an activity which links specific characteristics to their center of unity and permanence, which is, at the same time, their center of production, their cause.

Corporeal phenomena have, therefore, a twofold reality : the most apparent is that of their multiplicity, their mobility, their passivity; the more profound is that of their unity, their stability, their activity. They show themselves, therefore, as individuals, as substances, manifested through their determinations, their accidents. Corporeal substance is as real as phenomena, as a matter of fact even more real.

2. *Meta-physical analysis* reinforces that of experience. Phenomena are real. Therefore each of them is either accident, or at the same time substance and accident, or pure substance, because a reality can be only completely relative, or completely absolute, or absolute and relative at the same time. Now we must reject the first hypothesis and conclude to the existence of a corporeal substance, because a relative without some-absolute is a contradiction in terms. An accident, being by definition a determination of a substance, cannot be the only reality.

We may say positively : the real is necessarily based on some absolute essence, and there is a real, which is most certainly phenomena. There is also an absolute essence, a substance, which is the foundation of their passing reality. The principle invoked here is nothing more than the very light by which the mind knows anything, it is the principle of sufficient reason : a relative essence can not be the total explanation of itself. It is of its nature to have a reference to determine it. It must ultimately be explained by an absolute.

3. *What are the corporeal substances?* Common sense is deceived sometimes in distinguishing them : it judges bread, wine, milk, the earth to be substances. The scientists, however, see in these things mixtures of numerous substances, many of which are specifically different. The chemist does not deny the existence of substance, but situates it at a level where common sense does not dream of looking for it, since he has

a notion of substance very far removed from the utilitarian notions of everyday life : he will admit, for example, that there are as many individuals in bodies as there are molecules, e.g., in water, alcohol, butter, calcium, silicon. In view of these structures within substances we will give a certain preference to scientific judgments, since they exemplify more concern for objectivity than the judgments of common sense. We must therefore indicate the following as so many individuals substantially distinct : (1) independent!}' *living things*; (2) perhaps separated *crystals*; (3) free *molecules*; (4) uncombined *atoms*; (5) positive or negative *electrons* and *neutrons* existing in a state free from any atom. In many other cases, it is difficult to recognize a distinct individuality and consequently difficult to single out a substance apart from the others. Such are the cases wherein our evaluation of the unity and permanence of structures does not reveal whether or not the unity or permanence is superficial or radical. Is a colloid *micella* more than an aggregate of molecules? Is a *-pebble* one substance? Is a *colony of hydrae* a single differentiated organism or an association of distinct individuals? The philosopher can only wait for further precisions from science in order to give an answer. However, he has no need of these precisions in order to affirm, on the one hand the necessity, and on the other, the real existence of corporeal substance, or that a problem is suggested at the levels mentioned above.

Here is a corporeal individual and it makes little difference whether it is an atom or a molecule. It is *specifically distinct* from a host of other things which are different species; it is *numerically distinct* from a multitude of other individuals of the same species; it is really *identical with itself*, yet always different from what it was and what it will be.

Three major systems offer the principal philosophical solutions : mechanism, dynamism and hylomorphism.

C Mechanism makes the substance of bodies consist in *extension* as diversified by *local movement*. This conception is quite different in Cartesianism and atomism.

EXPOSITION :

1. *Cartesian mechanism* is *geometric*, i.e., based on the continuous extension of geometricians.

a. A body is only extension : " The nature of matter or a body, taken generally, does not at all consist in its being hard, heavy, colored, or in being an object which touches our senses in some specified way, but only in being substance having three dimensions, length, width and depth. " Through a body " we know clearly and distinctly that it has *all* that it needs to have as a body, if it has extension in length, width and depth, from which it follows... that its nature is simply this, an extended substance " (II, 4).w

A body is space itself: " The same extension... which constitutes space constitutes bodies " (II, 10).

There is no void, nor atoms : No void is possible, for there is no " space where there is no substance... because the extension of space... is not different from the extension of a body. "

Atoms are not possible, i.e., " parts of bodies... which are by their nature indivisible. " For " these parts, as small as we may imagine them, are nevertheless extended, and thus are always able to be further divided... from which it follows that they are divisible " (II, 16 and 70).

Matter is infinite and identical : " This world has no limits at all... for the idea of extension which we conceive in relation to every space is the true idea which we ought to have of every body " (II, 21).

" There is then only one and the same matter in the whole universe, and we know it only in this, that it is extended, and all the properties which we distinctly observe in it are reducible to its divisibility and the movability of its parts " (II, 23).

b. Only local movement is real : " Movement, (that is, that which is made from one place to another, — for this is the only type of movement one can conceive, and therefore it is)*

* These numbers refer to *Principia Philosophiae* of Descartes.

not necessary to suppose another type of movement in nature) is not an action as we have conceived it " (II, 24), but " the movement itself, and not the force or the action which is the cause of movement. " " It is a property, not the substance of the mobile, in the same way that figure is a property of a figured thing " (II, 25).

" This movement is nothing outside of the body moved... in such a way that movement and rest are only two different modes of being in a thing " (II, 27).

Its possibility in a space which is filled demands the existence of vortices to explain movement (II, 33).

Its general cause evidently can only be God, " who, by His Almighty Power, has created matter with the movement and repose of its parts, and who now conserves in the universe, by His ordinary concursus, as much movement and repose as is there by creation. " God, being immutable in Himself and constant in His action, " incessantly conserves in this manner an equal quantity of movement " (II, 36).

As to the particular causes of such changes, those which are corporeal are all embraced in this rule : " If a body which is moved encounters another, and has less force to continue its movement in a straight line than this other has to resist it, it loses its determination (its direction) without losing anything of its movement : if it has more force than the object it encounters, it moves this other body along with itself and loses as much movement as it confers on the other " (II, 40).

The conservation of the quantity of movement is affirmed. But Descartes here appeals to two types of force : a motor one, and one of resistance. His successors, especially Malebranche, will purify this mechanism; they will see, more clearly than Descartes, that pure extension is completely passive, and they will not recognize any other motor activity than that of God.

2. *Atomistic mechanism*, on the contrary, admits that extension is made up of extended and indivisible atoms, in movement through a void. Moreover, it claims a metaphysical foundation for this, since the atoms as expression of substantial

nature explain all the properties of bodies. Bodies are not, therefore, subject to substantial change, since changes called substantial are those which rely only on the testimony of the senses. This is the position of *Democritus* (470 B.C.), *Epicurus* (341-270 B.C.); and *Lucretius* (99-55 B.C.) who exposes this idea poetically in his *De Derum Natura* :

Inde aliae atque aliae simplices ex ordine partes
 Agmine condenso naturam corporis explent;
 Quae quoniam per se nequeunt constare, necesse est
 Haerere ut nequeant ulla ratione revelli.

(Lib. I, v. 599-602).

Democritus represents the most radical atomism; Epicurus endows the atom with a proper movement perpendicular to the direction of its fall; Lucretius attributes to it a specific figure. The Arab theologians go back to Democritus in their attack against the Aristotelians of Bagdad (Avicenna, 11th century) and those of Cordova (Averroes, 12th century). The physics of the Renaissance preferred Democritus to Aristotle. Descartes gave to mechanism the wings of analytic geometry, but, despite Descartes, the atomistic concepts triumphed in mechanism. Atomism became less and less a metaphysical theory. The atom, for Dalton (18th and 19th century), the father of chemistry, is no longer any more than the smallest fraction of "substance" capable of being combined or isolated during states of chemical decomposition. This purely scientific atomism is indisputably true : it does not claim that atoms or sub-atomic particles are the profound nature of bodies, but it asserts their existence and studies their laws. There is, however, a metaphysical atomism, which nourishes itself on scientific discoveries, and marries itself willingly to a kind of dynamism, analogous to Epicurean atomism. In this line, we can point out the following forms of metaphysical mechanism :

a. *Pure geometric mechanism* (Descartes) or pure atomistic mechanism (Haeckel; Father Secchi, S.J.). It admits *no force*; movement is the only differentiation in extension, whether it is continuous or discontinuous (Cf. Nys, *Cosmology*, p. 41).

b. *Mitigated mechanism.* It admits that atoms are endowed with forces, which are purely *mechanical*, i.e., attraction and repulsion.

c. *Dynamic mechanism.* It admits that atoms have other *specific forces*, e.g., affinity.

EVALUATION

We must *praise* mechanism because : (1) it recognizes the reality of extension and its fundamental role in our experience of corporeal phenomena; (2) because it gave Descartes the idea of applying the mathematical method to the study of these phenomena, and liberated scientific effort from the shackles of philosophy.

But *it makes a metaphysical error* by identifying extension and corporeal substance. Actually :

1) *Extension* can not be the *essential element of a thing*. The second of the Kantian antinomies employs in its "thesis" a rational exigency clearly seen by Leibniz : "Everything in the world is made up of simple elements." This principle is true, if it is applied to substance : there must be a simple in everything under pain of absurdity; if nothing simple exists, then by suppressing the union of parts, nothing could be said to exist, and then how could anything be made up from them? But no part of extension is simple and, on the other hand, the simple cannot be explained by the composed : we must then have in everything a principle of simplicity completely different from extension.⁶⁰

2) *Qualities are irreducible to extension.* Substance ought to be the source of its qualities, of the qualities more or less proper to it. Now extension, by itself, passive and undetermined,

M The second principle of monadology is obviously opposed to Descartes : "There must be simple substances, since composites exist, for a composite is nothing other than a grouping or aggregate of simple things." Lachelier comments on this : "That which constitutes the reality of an aggregate are the elements which compose it and not the relation of these elements among themselves." Here we have merely the placing of parts outside of parts, which is completely extension. Therefore, there is neither element nor substance.

cannot determine itself nor qualify itself. We must look elsewhere for a source of the differentiations found in extension. We are told that it is local movement, originated by God, and then transmitted from one part *of* extension to another. But then one conceives extension and movement as two realities so diverse that they can not be attributed to a unique internal source, substance. One is forced then to root movement in extension.

This is exactly what mitigated mechanism does, by endowing extension with forces, through which it contributes to movement. But this is only to be aware of the problem ! How conceive this substance, which is on the one hand passive extension, and on the other, an active force? This mechanism may perhaps be a good description of the facts, but it has no metaphysical value.

3) A substantial *individuality* finds no sufficient reason in its extension. Extension is by its nature indefinitely divisible, that is, by its essence it is not individually determined. In an individual thing extension possesses actual limits, but these limits are not able to be deduced from extension.

One can object that movement can divide extension by individualizing its parts. Certainly. But is the individuality conferred on these parts substantial? No. There would always be, before as well as after division, only one infinite substance, of which certain parts would be immovable, while the others would be moved in different ways. Local movement is only a mode of being; it can only modify accidentally, in a passing way, a particular section of extension-substance.

There are those who have attempted to arrive at individuality by attributing it to indivisible atoms. But then, they are faced by the contradiction which Descartes denounced in the idea of an atom; "an extension which would be indivisible." If extension alone constitutes substance, we must recognize in it an unlimited divisibility. But if one says that it is limited by the indivisible atom, we must answer, limited by what or why? And this extension would cease to be the substance itself.

Why should an atom, which is extended and thus divisible by a natural necessity, not be divisible in fact? In short, the atom can only be the expression of a fact, and that is what it is in modern chemistry; it is not an explanation, it is a problem.

4) *The specific nature* of corporeal substance can not any more than individuality find its ultimate explanation in extension. The specific character of things is expressed by qualities, which mechanism has badly misunderstood (*supra*, 2).

But it should not be here simply a question of giving a foundation for geometric qualities (structures) and for energy-qualities (forces); it would be necessary to point out the substance itself, as the foundation of determined groups of qualities, which chemistry calls the properties of different pure bodies. It should be necessary also to point out what makes these qualities endure and does not allow them to be separated, except to be reconstructed, while they remain specifically identical throughout the disordered movements in which the kinetic theory of gases and the theory of solutions show them to be bound together. The permanence of specific types — molecular and atomic structures — is a problem which no system of mechanism resolves. Movement and extension can be involved in any kind of material groupings and, as a matter of fact, must be involved in them. But real nature offers us definite groupings and even utilizes them to form elementary particles which are already qualitatively specified: protons, neutrons, negatrons; and a real extension furnishes them a field in which their specific energies are exercised (gravitational, electrical and magnetic).

5) Consequently, substantial change is unthinkable in any form of mechanism: no individual or specific newness is possible where all is reduced to the indefinite of extension, or to the indefinite relation between movement and extension.

If we think of things at the atomic level, we are forbidden by mechanism to see there any evidence of substantial change. On the one hand, they are indivisible, and on the other, each one keeps its individuality. They can only be united from

without to form completely accidental and transitory aggregates.

The atoms of chemistry, however, have no other mission than to describe the facts correctly; they can, they must be understood (Cf. *supra* : substantial change) as indicating the existence of specifically distinct substances, subject to change in their fundamental make-up. They present us, in a scientific way, with the problem which we have to resolve : What ought substance to be, when it is shown in our experience under varying characteristics which are very difficult to unite?

D. Dynamism offers us no more than mechanism in the solution of our problem. Dynamism is sometimes spoken of in connection with the Stoics, but their doctrine should be more properly referred to as hylozoism. For them the whole universe is a single living being whose soul is God. Sometimes dynamism is connected with Aristotle because of that kind of tendency or aspiration which he places in the heart of matter which he calls "potency" (dynamis); this way of speaking is inexact, for, with him, potency is above all receptive, passive. It is not a force.

Dynamism is a system which describes corporeal substance as an *activity* (a cause, a force), a *life*, or even a kind of *consciousness*.

EXPOSITION

1. *Leibniz* (1645-1716), by his outright dynamism, was in reaction against Cartesianism. For him : (1) extension is only a phenomenon; (2) every composite must ultimately be reduced to simple elements, and if simple, consequently unextended. Thus substance is a unity, a "monad." Each monad, being at the same time distinct from the others and simple, is internally *dissimilar* to all the others. The nature of substance is *activity*, force, but since extension is not substance, the activity of substance is *purely immanent* and consists of perception and appetite. Finally, since a monad does not act

on other things because this sort of action demands extension, Leibniz is forced to explain the apparent activities and receptivity to outside forces in monads by his theory of "preestablished harmony," which God imposes on them in creating them.

The activity of each monad is thus the source of its own changes, analogous to the springs which move the hands of a clock. This activity has a twofold aspect :

a. It is a *force* which produces changes. It resembles desire ; it is a tendency to action which sets in motion and really changes being (appetites).

b. It is also the reason of the succession of the order which exists in successive changes. It is like a *flan*, a *directing idea*. Thus it resembles internal perception which explains the order and finality in movements.

Thus every monad or simple substance is like a person, who has a " within, " and which realizes itself through its proper changes by reason of knowledge and desire.

This resemblance to person varies infinitely from one monad to another, and it is the degree of consciousness which distinguishes one monad from another.

Corporeal monads exist in an infinite multitude in each body (Leibniz here makes a kind of infinitesimal " metaphysical " analysis), and are unified in each body by reason of their order, one ruling the others.

This ruling, however, is not an action, but an order which subordinates all to one in the plan of God. Actually, all monads are united in a single general order, wherein each has its place, harmonized by God, in relation to other monads. But in this general order there are particular orders. Thus each body or composed monad sees all its monads unified by one higher monad, which is superior in relation to the others which make up a composite thing.

To sum up, there is an *immanent activity*, analogous to that of consciousness, in every monad ;

There is an *order* of monads *in each body* or composite substance ;

There is a *general order* of all the substances in the whole universe. This general order is a *reestablished harmony* set by Divine Providence. Such are the principal characteristics of Leibnizian dynamism. It joins to a penetrating view of the " within " of substances a most elevating vision of the finality found in things themselves by virtue of Divine Providence.

Dynamism, however, quickly lost sight of this twofold intuition, and it was as combined with mechanism that *Wolff* (1679-1754) propagated it, substituting mechanical forces for psychical activity. *Boscovich* in the 18th century, and *Carbonell* in the 19th, expose it simply at the level of phenomena. All that is retained from Leibniz is the non-substantiality of extension. They accept all the rest of mechanism, and tend to identify matter with an energy which has no material support (energism).

2. It is *Bergson*, in his creative evolution, who seems to have done the best job of resurrecting dynamism. He shows a vital current in matter which is diminished to the point of stopping, " a creative motion which destroys itself. " " Life is movement; materiality is an inverse movement." For him, as for Leibniz, the basic element of all reality is consciousness, but a consciousness which is developing, and this is life. There is also a consciousness which is regressing, and that is matter. Allow consciousness to unfurl in creative invention, and you have life. Make it stiffen in habit and you have matter. For Leibniz, however, it is confused consciousness which characterizes matter. For Bergson, on the other hand, it is a clear and distinct idea, made up of habits which express matter — pure geometry. For *E. I. Roy* it is a bit of the same thing, matter is " a group of dead habits. "

This twofold aspect in life, invention and habit, has its source in a vital impulse (*elan vital*), the first form of existence in the world, leading to " the idea of a free and creative God, Generator at the same time of matter and spirit. " (Letter of Bergson to Father de Tonquédec, cited in Jolivet's *Sur la Philosophie Bergsonienne*, p. 59.)

EVALUATION

We must *commend* dynamism : (1) because it recognizes the originality of force and quality in general in relation to extension; and (2) the superiority of life over matter, which, in the final analysis, arises because it comes from life, i.e., from the Thought and Will of God; (3) because it affirms the "continuity" of nature,[•] and particularly the similarity of metaphysical structure between man and matter. These last two merits are as much in an ontological order as they are in a cosmological one, and are shared by both Leibniz and Bergson.

But dynamism is an error, because it makes corporeal substance a force, whether immanent and of a conscious nature, as in Bergson and Leibniz, or completely mechanical as in Wolff and Boscovich.^{e8} Indeed :

a. *Extension* is as irreducible to force as force is to extension. To reduce it to a psychological force is to deny its reality and accept idealism. To derive it from a mechanical force is to either reduce force to its measure which is a straight line, i.e., extension, or to commit oneself to constructing the extended from the unextended. The first hypothesis is equivalent to pure mechanism; the second forgets the simplicity of a quality and the mutual exteriority of the parts of extension.

Can one say that he accepts forces situated in centers which are separated one from the other? This hypothesis is only a scientific position, based on the given data of extension and

[•] *Continuity* can be understood in several way's :

- 1) an absence of spatial distinction : thus space and time are continuous,
- 2) an absence of specific distinction : materialism asserts the continuity of matter, life and spirit.
- 3) a generic resemblance despite a specific distinction : in this sense there is a continuity between minerals, vegetables, animals and men.
- 4) a hierarchy of species or of kinds whose degrees are very close and progressive. Thus, we speak of a "continuous" series of whole numbers; and so we can speak of a hierarchical continuity of species, in which a lower species of a genus, in a manner of speaking, touches a higher species than the genus of that which is below it. "Natura superior in suo infimo contingit naturam inferiorem in ejus supremo."^{*} St. Thomas, *S.C.G.*, II. ch. 91.

^o See Maquart, *Elementa Philosophiae*, Vol. II, p. 27.

force. This hypothesis, however, does not even touch the metaphysical problem, which is: How explain this compénétration of force and extension at the heart of the same individual being, whether it be monad, a simple being, atom or electron? How can these *two* realities be *one* substance?

b. Certainly, *qualities* are recognized by dynamism. But what becomes of the corporeal character which they limit by their presence in an extension determined by them? We can describe these qualities in psychological terms, but we cannot deny them real extensional character, as Leibniz did.

c. *Individuality* is safeguarded only by the monad or simple being.⁶⁹ Now the atom, the molecule, the plant, the animal have their substantial individuality which can not coexist with that of each constitutive monad. According to dynamism, it is necessary that these bodies should be no more than aggregates of individual beings, deprived of real unity. At the most they are *societies* of individuals, endowed with a real unity which is completely accidental, and which consists in the simple cooperation of all in a common good.

Leibniz himself felt the necessity of uniting the monads of one individual in a much more profound way, and admitted a "vinculum substantiae," very difficult to conceive, since the monad remains very much a substance in itself.⁷⁰

Moreover, that which distinguishes one monad from another is indicated, but not explained. Each monad is "a living and perpetual mirror of the universe" (*Monadology*, 56); that which distinguishes monads is the limited manner in which each represents the whole universe (*Monadology*, 60). Certainly, if the points of view on the universe are *already supposed as distinct*, one can single out different individuals.

d. *The specific nature of corporeal substances* is also left unexplained. First, in the dynamisms of Wolff and Boscovich, the mechanical forces are the same in all monads and they

* See Leibniz, *Monadology* pp. 8, 11, 12, 56, 60.

' See De Raeymaeker, *Philosophy of Being*, pp. 186-189.

alone characterize them. Hence only one kind of substance is possible. Leibniz has no better explanation for specific kinds of substances with his reasoning on consciousness. All monads are of the same family, all being endowed with perception and appetite. They can differ only by degree, by reason of the clarity of their knowledge and the intensity of their desire, which after all is a simple accidental difference.

Thus the variety of kinds which science recognizes, which at least has some basic accord with common sense, must be asserted as being only apparent. But this appearance demands an explanation ! Bergson has proposed one : intelligence judges things according to their utility and not their truth. Can there be a utility in distinguishing kinds in a world where kinds do not exist? What adaptation to the world can we make by a knowledge which is completely apparent and not real?

e. *Substantial change* is possible (in appearance) since composite substances are admitted. But this is, at best, only a society of substances which are formed or transformed. This still remains an accidental change to our way of thinking. The only true substances are monads and they are substantially stable.

to conclude this negative discussion, let us point out the *common errors of mechanism and dynamism* :

1) Each admits as real only one part of experience, whether it be extension or force.

2) Each one eschews explaining the illusion by which we hold the other part of experience to be real. Neither extension nor quality can be constructed.

3) Both make substantial individuality unexplainable, because it is, on the one hand, a determined unity and not that of an indefinite divisibility, while on the other, it is the unity of a composite and not that of a simple being.

4) Both make the specific distinction between bodies illusory, and each explains all by one common stuff, either extension or force.

5) They deny, consequently, the existence of substantial change, and drift towards an idealistic phenomenalism.

The fundamental error of both systems is to make substance an essentially relative reality. The relativity of extension, force, and movement is obvious: (1) extension, forces, movements, are variable in the same individual;⁷¹ (2) no one of these properties can be the principle of the other,⁷⁵ nor can it be an absolute; (3) each, on the contrary, needs a principle in the individual substance which it determines.

E. Hylomorphism, or the matter-form theory, avoids these derived errors and their common source. The explanation which it gives is undoubtedly incomplete (it does not pretend to know in what the individuality proper to each corporeal substance consists); but it is true, because it takes into account all experience and remains open to further enrichments.

HISTORY

It was *Aristotle* who was the first to formulate it as an explanation of substantial change. *The peripatetic school* defended it until its end in 200 A.D. It was still known in the fifth century, but only in a *Neo-Platonic* transposition, which made matter a divine thought. In the fifth century, *Augustine* Christianized it by making it a creation of God (*Confessions*, L. XII, Ch. 4 to 7); but among the Fathers of the Church in general, it was confused with unformed matter which was the initial state of the world according to Genesis. It was through the *Arabs* (Avicenna in the 11th century, Averroes in the 12th) that this Aristotelian theory was transmitted to the West in the 13th century, when its principles were accepted through the expositions given them by the age's most illustrious

* Think of a seed which germinate», grows and becomes a tree : here we have a substantial identity notwithstanding the considerable changes which have taken place in volume, structure, activity, and movements undergone or produced.

« Substance (a being which has existence in itself) expresses itself in properties. It is the principle, the reason, the explanation of them.

teachers : Alexander of Hales, Albert the Great, Thomas Aquinas, Bonaventure and Duns Scotus. The progress of physics starting in the *Renaissance* and continuing through the following centuries relegated it to obscurity. Beginning in the middle of the 19th century, the *Thomistic revival* finally clarified the doctrine with the distinction between a physical and a metaphysical explanation. The former as a physical explanation of matter has perished, but the latter must remain, according to the words of Bergson, as “the natural metaphysics of human understanding.” The majority of Catholic philosophers teach it today, at least as a probable opinion, if not as a truth demonstrated in every point. There are even scientists who are not afraid to use it as a framework for the most general biological facts (Rémy Collin), or who see in it a metaphysics to which the study of thermodynamics naturally orients itself (P. Duhem).

The Critical Essay on Hylomorphism, by Father Descoqs, does not envisage denying its truth, but attempts to establish the theory on a much more stable scientific ground than that of Aristotle. Aristotle built his theory on substantial change. Father Descoqs challenges the validity of this proof in establishing the purely potential character of prime matter, and he proposes some arguments, which, according to his mind, are more demonstrative.

Substantial change, nevertheless, furnished a first light. It is a very real fact, it is an experimental fact. Why neglect it?

PROOFS

The first step is assured by the analysis of substantial change, which leads to the demonstration of corporeal substance as a *composite of potency and act*.

Substantial change actually exists in the world and is possible in every kind of body. Now every change demands a subject composed of potency and act in the same order wherein the change is realized. Change is the act of a being in potency, but this being is not only potency, for, since it exists, it is already a being, a “completed thing” in some way, and because of this

it is an act. Every mobile is therefore a composite of potency and act. It is that in the same order in which it is capable of changing. Change is cessation of one act and the beginning of another, each of the same given kind which actually specify the change. However, the mobile must be said to have a potency proportioned to its successive acts. It is necessary, therefore, that a being capable of changing substantially should be a composite of potency and act, both being substantial principles. Consequently, corporeal substance is an essence composed of act and potency. This is the hylomorphic doctrine without any of the precisions implied in the notion of prime matter.

Father Descoqs proposes an argument in the work cited above (p. 25) and concludes with Suarez (Jesuit professor of the 16th century, at the Roman College) : " If we are speaking... of *prime matter* as the *first subject of mutations and forms*, and abstracting from the nature of this subject and from the nature of this form which is received into it, the reality of prime matter is certainly as evident as the reality of the transformations in nature which abound in varying forms " (*Disput. Metaphysicae*, Dist. 13, S. I).

Thus all the cases of substantial change analyzed previously show an alliance of two realities in the one corporeal being : a real potency and a real act, both together constituting a corporeal individual; a " power-to-be, " which is actualized in one way and then in another. Two substances, one of which has become the other, have the same " power-to-be " (potency), a same matter determined successively by two different acts.

It may, perhaps, be objected that our conclusion is wider than the experimental facts which serve us as a starting point. Our affirmations concern all corporeal being. It is true that we are not able to cite evidence of substantial changes in every being, but this is not necessary. I have not yet experienced my death, but I know myself to be legitimately mortal. To give a foundation for our universal conclusion, it suffices that we have grasped *the possibility* of substantial changes in all kinds of individuals (cf. th. 3). Since every body *can* change substantially, it is then, in its individual substance, composed

of two principles, potency and act. But what is the degree of indetermination in this potency? This is a question which we must examine. Aristotle gives it an outright solution when he answers that it is complete indetermination, a *pure potency*, which he calls prime matter.

A second step remains, then, to be covered, and that is the affirmation with Aristotle that substantial potency is a *pure potency*, a *truly first matter*, whose correlative act is a "substantial form."

1. *The following notions* will show us the objective to be attained.

The notion of *prime matter* is described by Aristotle :

a. *Negatively* : as that which considered in itself is not some thing, nor a quantity, nor any other thing by which being is determined ;⁷³ i.e., that which in itself is *determined in no way*.

b. *Positively* : " It is the first subject from which anything becomes intrinsically and that which is last in any corruption, i.e., the first subject of substantial generation and the last term of corruption, or the permanent principle of substantial changes. St. Thomas expresses its positive role thus : " *Est susceptiva et formarum et privationum* " (*De spiritualibus Creaturis*, a. 1), i.e., it is the *receptive* reality of forms and their privations. In every way it is by relation to the form, the term of the change, that it is conceived.

The correlative notion of *substantial form* is described by Aristotle : " The first act by which prime matter is intrinsically completed and determined to this or that kind of corporeal substance. " ⁷⁶

2. *Useful precautions* for those who wish to stay on the right track.

" *Materia prima est quae, secundum se considerata, neque est hoc aliquid, neque quantum, neque aliud quid, quibus determinatur ens.*

M Primum subjectum ex quo intrinseco fit hoc aliquid et in quod ultimum abit, si corrumpitur.

n Actus primus quo materia prima intrinsecus completur et ad hanc vel illam speciem substantiae corporeae determinatur.

a. Nature and art. Let us compare nature making a new substance (the production of helium from hydrogen, as in the sun, or with the aid of man in the laboratory, it makes little difference), and man, the artisan, "homo faber," making an artificial object, e.g., a table.

In both cases it is not a question of creation, but of pure transformation. Preexistent materials are simply transformed; they acquire a "form," i.e., determined characteristics. This form did not exist before, but it was possible, really possible : 4 H was able to become 1 He, wood was able to become a table.

Yet the *power of becoming*, as it is manipulated by man when he seeks to impose a new form on things, is already very determined. The prime matter on which he exercises his industry is not first except in relation to the form of the fabricated object. Thus it happens that, what is matter at a particular level (a plank), is already a fabricated object, i.e., matter and form, at a previous level (that of a saw-mill, where the matter is constituted by the trunks of trees); and what is "informed" matter (matter with this particular form) at this particular level (a table) is still matter in relation to a higher level of organization, e.g., school furniture.

Aristotle thought that nature acted in a different way than man in fashioning bodies from a matter which was truly an absolute first, i.e., which in itself implied no determination, no form which in itself was the result of a previous fabrication. For example, he would have thought that nature would not take as matter for helium, 4 nuclei of hydrogen *as such*, while leaving them the properties they have in hydrogen, but rather that it would divest them of their proper substantial form, thus reducing them to an undetermined state, to endow them instantaneously with a new substantial form, that of helium.

Why this rupture in the matter-form analogy? Because man modifies only accidents; he confers only accidental forms and determinations on previously existing materials. To natural substances he adds only an arrangement, an order, which is superficial to them, which corresponds only to man's ideas

and interests. Nature, however, constructs true substances, and that is why its matter must be absolutely first.

b. Matter and form, therefore, are terms which must be taken in an analogous sense. This is not a case of visual or tactile form, nor of a spatial structure. These are the signals of bodies in relation to experience. They are in the phenomenal order, and not the substantial order. But, since the sensible form serves in the recognition of the object of perception, we call that which serves to differentiate and specify substances from "their within," *substantial form*.

It is useless to rely on sensation for any evidence of *prime matter*. It is a substantial principle, i.e., knowable only through intelligence. It is first in this sense, that it is not knowable in itself, but only in relation to that which can determine it, substantial form.

Must we think of it as first in relation to being, i.e., as independent and uncaused? This is an altogether different question. Being first in regard to that which determines it (the form), it need not be necessarily first in relation to that which would cause it (God). Aristotle did not foresee this distinction. He supposed matter to have existed eternally as uncaused being. We will take up this distinction when we pose the question concerning the Cause of the world.

For the moment, let us look into the question of the matter of corporeal substances to see whether it is truly first, i.e., pure potency.

c. Having consulted science, we see that there is no answer to the above question there. The light we seek cannot come from mathematical principles, but only from the metaphysical exigencies of the question.

Nevertheless, science indicates something akin to substantial change even at the level of the simplest and most fundamental determinations. Obviously prime matter can not be perceived in a state of pure indetermination. But is it not revealed in some way at that point where the most elementary characteristics which exist, viz., mass and electrical charge, begin or cease

to be? In the change of a proton into a neutron and vice versa, we have a mass which is charged and discharged. The photon is created by a pair of electrons, and a couple of electrons are "annihilated" in becoming a photon. Here mass is transformed integrally into an electric charge and vice versa.

Thus science recognizes that *no* experimental determinations are riveted indissolubly to the infinitely variable base of the corporeal world.

This *pure power of becoming*, this potency apt for being every kind of corporeal determination, which is prime matter, seems to be indicated in the very research of science.

Nevertheless let us proceed to the philosophical proof.

3. *Proofs.*

a. A little deeper look into substantial change will reveal prime matter to us.

To what potency will it lead us? To a substantial potency, to a *potency to substance*. It is that potency which in itself is not substance.

If we were to suppose that this potency existed in such a way that it had any kind of determination, as minimal as may be imagined, then we would be in the realm of substance. What would it lack for being substance, i.e., to exist with an existence of its own? Nothing. It would be something substantial, and something determined in the genus of substance.

It is, therefore, impossible that the *power-to-be-substance* implies in itself any determination. It must therefore be a pure power to exist, prime matter.

b. The arguments of Father Descoqs have a less immediate evidence, although they are built on a very solid logic. They rest on this fundamental principle which particularizes the principle of sufficient reason: "Every phenomenon indicates a substance, and its nature reveals the nature of the substance." Substance, actually, is the principle, the sufficient reason of phenomena.- *That which is is principle, the sufficient reason of that which appears.*

A being can manifest itself in experience only according to what it is. Whether its manifestation (a phenomenon) be linked to it as something produced, or as something undergone in any way, its "behavior," incompletely but faithfully and necessarily, translates that which it is.

"Operari sequitur esse" — "Operation follows existence." "Quidquid recipitur ad modum recipientis recipitur" — "Whatever is received is received according to the manner of the receiver."*

Consequently, we must affirm of corporeal substance whatever is *necessary* for it to show itself as it appears in our experience.

Now what are its most general characteristics in experience?

1) *Insofar as it is extended*, a corporeal individual is at the same time undivided and *indefinitely* divisible, i.e., it is one in act and multiple in potency with an *undetermined* multiplicity (Thesis I: first, second and third parts).

Now it is that *essentially*, for it is that, by reason of its *extension* without which it would not be corporeal. Therefore, it possesses *in itself* at the same time, the principle of this determined unity, and the principle of this undetermined multiplicity.

But that which is a *principle of unity can not be* at the same time a principle *of multiplicity*. That which is a principle of determination in relation to quantitative limits cannot at the same time be a principle of indetermination in relation to the same limits.

A corporeal individual is, therefore, made up of two principles, one a principle of determined unity, the other a principle of undetermined multiplicity. The first is determination, act; the other is indetermination, potency, and *pure* indetermination, i.e., which contains in itself no reason to be determined, and is not determined, except by a complementary determination (*Essai critique, sur III.*, pp. 232-268). (In short, the *indefinite* divisibility of extension has its sufficient reason in the substance of the body itself. This substance.

then, embraces a purely indetermined principle, capable of receiving all the possible determinations of a body, which is equivalent to saying that a body implies a prime matter, a pure potency.

Despite appearance, we attain matter only as a principle of movement. Dividing the continuum is a way of changing it. Let us directly consider movement in its relation to substance.

2) *Insofar as it is mobile*, the corporeal individual is at the same time active and passive, cause and subject of movement. Its movement reveals in it this double aspect, for it is at the same time subject (passivity) and cause of other movements (activity).

Now a body is essentially mobile, because mobility is derived from extension.

Therefore it has at the very core of its being the principle of this activity, as well as that of this passivity. Whoever doubts this, can recall that the activity of a body, which is moved locally, depends on a specific constant at the interior of the mobile, which is measured by mass, and that the activity of qualities is a specific constant as well.

We must again recognize an essential composition of two distinct but complementar}' principles in a corporeal substance; one, the sufficient reason of passivity, the other, the sufficient reason of specific activity. The latter is specific determination; the former is indétermination, pure receptivity, pure capacity to undergo change (P. Descoqs, *Essai sur l'Hylémorphisme*, pp. 26S-272).

3) *Insofar as it is extended and qualitative*, the corporeal individual presents itself to experience as an indefinitely undetermined determinable and, at the same time, actually determined in a specifically definite way (proper qualities), or linked to specific determinations (accidental qualities). The substantial principle which is the sufficient reason for extension is not to be identified with the substantial principle of quality. On the other hand, the principle of extension must realize the receptivity of extension in relation to quality, and its pure

receptivity. It can be only potency and pure potency. Thus the principle of quality, the reason for its determined and determining character with regard to extension, will be determination correlative to the potency principle of extension, i.e., prime act of prime matter, substantial form (P. Descogs, *op. cit.*, pp. 272-280).

Thus in the three great aspects of our experience with bodies, the same characteristics are found: an undetermined *indefinitely* determinable, the undetermined aspect of extension, *indefinitely* divisible, *indefinitely* mobile, *indefinitely* qualifiable. This extension is certainly not the substance, it is only a phenomenon; but it reveals a substance and, in this substance, a reality which makes itself known through the characteristics of extension. Necessarily this reality-principle of extension is pure potency, without determination or a proper act, purely determinable. It is the prime matter described by Aristotle.

But it can be objected that, if matter is the principle of extension, it could no longer be pure potency, since extension is a determined kind of relation, the relation of exteriority. This objection forgets that extension is a reality undetermined in itself. Without any doubt, it is an "exteriority," which allows us thus to define matter in relation to a certain class of forms, either purely corporeal or realized in extension. It indicates that matter has a positive role in individuation, and receives a form communicating something of itself to the whole. However, the relation of exteriority, being undetermined by reason of the nature of extension, can reveal, in the matter which is its principle, only pure indetermination, relative only to corporeal forms.

4. *Other arguments* have been proposed, but they are debatable and, at this moment of our philosophical investigation, not too clear.

a. *The principle*, "*Actus non limitatur nisi per potentiam*," "Act is limited only by potency," can here give only probability. It is very certain, taken in itself, for every limitation is a negation of a beyond, which nevertheless remains possible in the positive

reality considered. This reality, therefore, is a complex formed of a positive perfection ("act"), and of the privation of that act ("potency")• But we do not know, at the moment, the nature of the reality to which we wish to apply this principle. Consequently, the indubitable conclusion which follows, "Bodies are composites of potency and act," remains imprecise. Is this potency pure potency (prime matter), or is it something already determined but further determinable? In short, it does not seem that this principle can serve in the discovery of prime matter. It can, however, help in understanding it, once it is discovered, by including its existence in a much more universal law of being. This principle has its proper place in ontology, not in cosmology.

b. *The necessity of a principle of substantial individuation*, as distinct from a principle of specification, does not lead us any farther with certainty in the search for prime matter. What is necessary to explain the realization of a specific type in a number of individual examples? That there must be two principles in being, the mind grasps at once. But that the individuating principle ought not to be act in any sense, but only pure potency, lacks evidence. One cannot know from this whether prime matter exists, or whether it is the root of extension, i.e., the fundamental condition of spatio-temporal limits which are directly individual.

F. The properties of matter and form can thus be summed up :

1. Common Properties

a. Both are substantial principles, *incomplete substances*.

b. Each is *simple* in itself, not because of the whole, but as a natural part of a single substance. They are in no way parts which are outside of each other, for exteriority implies multiplicity. They are, on the contrary, *intimately present* one to the other, radically in a single complete reality, which is substance, and alone exists for itself. Neither one nor the

other is extended,⁷⁴ nor endowed with forces, nor even endowed with existence; but each in its way is a *-principle of a body*,⁷⁷ which alone exists for itself, which alone is extended and qualified. Each *tends* to be completed by the other. Their nature demands their union to the point that one cannot exist without the other.

2. Special Properties

Substantial form is the *principle of all determinations*, beginning with the most fundamental ones, specific determinations, and the richest ones, forces. There are as many kinds of substantial forms as there are kinds of substances. From antiquity, the study of living things recognizes a *hierarchy* among forms, and contemporary science is forced to recognize one even among mineral forms, c.g., the form of a neutron is less rich than that of the atom, and that of the atom is less rich than that of the molecule, etc.

Prime matter, on the contrary, is a principle of indétermination, of passivity, of movement, and particularly of *extension*. It *neither begins nor ceases to be* (it is non-generable and incorruptible) in substantial change; it is precisely by reason of its *permanence* that substantial change is possible; it is, in itself,⁷⁸ *identical* in all bodies, being the principle of the characteristics common to all matter, an aptitude to all changes and to all determinations of a corporeal kind.

•If matter and form are each without extension, how is it that the substance, of which they are parts, can be extended? It must be remembered that the union of the two substantial principles is not at all the union of parts at the heart of extension. To indicate this difference, we call these parts *entitative* or constitutive parts, as opposed to those parts of extension which are called *integral* parts. The error, upon which the objection is based, is that extension is taken as corporeal substance itself, instead of the most generic accident of that substance.

”Matter and form are not “*entia quae*” (beings which exist) but “*entia quibus*” (beings through which substance exists).

•Only by itself, for wherever it exists, it is united to a substantial form. It is, actually, always determined : 1) by the form and its proper qualities; 2) by the transitory characteristics which the influence of other substances, whether near or far, produce in the substance itself.

G. The role of matter and form is multiple. Let us investigate :

1. *their mutual role.* Matter and form complete each other. Matter gives to form a determinability, and form communicates to matter a specific determination. Matter receives, the form is received. Matter concurs in the existence of a form, and the latter, in a very different way, makes matter exist. Matter and form *cause each other reciprocally* from within substantial being. This reciprocal causality is in no way contradictory, since the modes of their causality are different, one as determining, the other as determined. *•

2. *their role in the constitution of substance.* Matter and form, by their union, *wake* a corporeal substance *exist* by *constituting* it, i.e., in forming an essence apt to exist of itself, apt to subsist.

The substantial composite is at the same time individual and a member of a specific class. Its principles, its matter and its form are as individual and specific as it is itself. But in the composite, what is the principle of specification, the source of the properties characterizing all the individuals of the same species? What is the principle of individuation, the sufficient reason which makes a corporeal being an undivided whole in itself, distinct from every other of the same kind?

a. Without any doubt, the principle of *specification* is the substantial form : to specify is above all to determine.

b. The principle of *individuation* in material substance, according to the whole Thomist school, is prime matter, as it is the principle of extension. St. Thomas constantly employs the formula : * *Materia est principium individuationis formarum.* "

Scotus and Suarez think otherwise. They hold that each real entity, matter, form, and the composite, is individual

*» In a similar way, marble and a sculptural form are mutually existent. The marble is such an object only because of the form, and the form is nothing real without its marble support.

in itself, or better still, individual by that which is most actual in itself, by the "ultima realitas entis, ultima actualitas formae," as Scotus said, who baptized this formal actuality, "hacceitas."

Hamelin agrees with this doctrine of "individuation by reason of the form," and finds the Thomistic teaching lacking any solid reasons.

1) *Let us try to sort out* several distinct problems which are often mixed up in the discussion of this question to such an extent, that it seems to cause, at least, a part of the obscurity often associated with this problem.

a) *What is individual* in a substance? Strictly speaking, everything : the matter, the form, the existence, and all of the accidents, even though contingent, because they belong to this substance in an incommunicable way.

Scotus and Suarez seemed to have wished to stress this truth in their teaching.

b) *What is the basis* of individuation at the very heart of species? The question has a threefold sense :

(1) *Logical*. How do we form the *idea of* the individual beginning with the idea of a kind, or species?

(a) It is not by adding the idea of real existence to that of abstract essence, since nothing abstract really exists as such. Yet we are able to conceive an individual of some species as being possible, as well as being actual.

(b) But it is by adding an *individuating notion* to the notion of species or kind, in the same way that we pass from genus to species through a notion called specific difference. Thus, as "rational" added to "animal" constitutes the species man, in the same way the notion "this" added to the notion "man" gives me the notion of "this man here." This individuating notion is naturally a sensible sign whether general (able to be used in a number of instances), as are the words, "this," "that," or whether concrete, and not able to be used in a number of instances (the timbre of this voice, this carriage of the head, this walk).

Thus, logical individuation is a process highly analogous to the process of specification. It is done by the addition of a form, i.e., by another notion enriching the meaning of the specific notion, this latter being less determined, potential in relation to the " form " of individuation.

Scotus has seen the problem in this logical sense, adding an individuating note to the notion of species, but he has taken care not to add a second real or ontological form (as individuating principle) to the substantial form. He sees there only the ultimate reality of a form.

Hamelin has seen this problem only in the logical sense, since, for him, it is identical with the ontological problem. In his idealism, all reality is thought. The order of thought, and the order of reality, are one and the same.

(2) *critical*. How *do we discern* one individual from another in the same species? We have recourse to individuating signs, which serve us as reference points. These signs are almost uniquely of a sensory nature, and are summed up in a grouping of sensible qualities characterizing an external contour and a configuration within it. Briefly, it is these *marked-off dimensions* of which the Thomist formula takes note.

Nevertheless, are not these dimensions variable in the same individual? That is true; yet the indication of individual presence remains possible, provided we grasp the quantitative variations as linked in a continuous flow. Where we no longer perceive this continuity, we do not recognize individual identity, e.g., a child who has been lost for 30 years, or a sub-atomic particle whose position is wiped out by a vast sound wave in space.

The experimental problem of the recognition of the individual is not directly our problem. But it is linked to ours and guides us in our solution, because there must be a close relationship between the internal factor, which constitutes an individual as such, and the sign by which it is distinguished from others.

(3) *ontological*. Here then is our problem. If the substantial form is the explicative source of specific properties, how is it that these properties are actually found in a number of individuals?

Because of the form? No. The form makes the individuals who possess it specifically similar, and it can not at the same time make them individually dissimilar. It is that which unites individuals, which identifies them; it cannot be that which separates them and opposes them as individuals.

Because of matter? It must be, since matter and form are the ultimate constituents of a material essence. Outside of this essence there is nothing else in being except its act of existence and its accidents. Now, existence adds to essence no new characteristic, it supposes an essence that is individualized and makes it exist; as to accidents, they suppose an essence constituted in its individuality from whence they draw their own individuality. Extension, nevertheless, beyond the individuality which makes it the extension of this substance, possesses in itself at least a potential individuality, since a part of extension is necessarily opposed to the others and distinct from the others by its very exteriority.

2) Let us make some *further -precisions*. How is matter the principle of individuation?

a) Taken in itself it is not. Being purely undetermined, receptive and indifferent to any particular form, it has no power of individuation. * * *

**Sec *Summa Thcol.*, Ia pars, q. 75, a. 5; q. 85, a. 5; q. 86, a. 3.

St. Thomas makes the formula more precise, when he studies the problem for itself. In the *De Trinitate*, q. 4, art. 2, he teaches that matter as it is individuated is the support of dimensions, not however the definite dimensions of size and figure (otherwise, an animal, in growing, would change its individuality), but as the support of indefinite dimension. "Materia efficitur haec et signata secundum quod est sub dimensionibus... Et ex his dimensionibus interminatis efficitur haec materia signata et sic individual formam." Thomists, nevertheless, discuss the precise way in which these indefinite dimensions are attached to prime matter. See C. Boyer, *Cursus Philosophicus*, I. p. 483, for one opinion, and Maquart, *Elementa Philosophiae*, II, p. 56, for an opposite viewpoint.

b) But matter is the principle of extension. Now extension exteriorizes that which it affects. It, therefore, confers on the substance of which it is an attribute, i.e., on a substance which has prime matter as a constitutive principle, the aptness for realizing its specific characteristics (those of the substantial form) through parts which are exterior one to the other, and also mutually exclusive of one another. Thus we may say that extension confers the aptness to be distinguished numerically and actually, as soon as limits mark a border between this and that.

Substantial source of a non-limited extension, “*signata dimensionibus interminatis*,” prime matter gives to the substantial form united to it, *the power of being distinguished* according to the parts of extension. It is thus the *fundamental* principle of individuation. However, in this state which is still one of indetermination, it could not of itself produce individuation concretely, or give to a form one individuality rather than another.

c) In order that this effect be achieved, there must be a cause which distinguishes this determined portion of extension from the others, and thus designates a prime matter, completely distinct, as source of this extension.

This cause must be a cause of local movement, since it produces a real division of extension. It consequently gives to concrete time an effective role in the realization of corporeal individuals.

If we, with St. Thomas, see in “*materia signata dimensionibus interminatis*,” i.e., matter as the general source of extension, the principle of individuation, it must be in the sense of a first principle, as the answer to this question : “For what reason is the individuation of a specific form *possible*?”

To make the problem more precise : “For what reason is this specific form realized actually and precisely *in this individual*?” We, evidently, can give no answer, unless we have recourse to the causes which make a new substance “arise” from the “corruption” of others. Thus, there remains the

task of making the role of these causes in individuation precise, by investigating how they actualize this aptitude for divisions in prime matter as it is the principle of extension. This problem is connected with that of the dispositions of matter and form (see fifth question).

3) *The role of matter in individuation.*

a) Here we have a question of prime matter as it is a principle of extension. Extension is the sufficient condition for the distinction of individuals in the same species. Being essentially an exteriority of parts, it allows the juxtaposition of essences in space. Through it, every corporeal form is found spatially situated and, because of the limits of extension, spatially distinguished from every other, i.e., individualized. Prime matter permits a form to be individually distinct from other forms of the same kind, since it is the substantial principle from which extension is derived. Matter, which is individual by its relation to a marked portion of extension, individualizes the form in receiving it.

b) However, we must conceive this individuation as a restriction imposed on the form and not as an enrichment, or an actuation which matter gives to the form. An objection can arise from our way of thinking about the relation of the species to the individual. Isn't the individual more determined than the species? Isn't the individuating, determining? How can matter, which is indétermination and potency, individuate?

These two answers are in order :

(1) Prime matter is indetermined taken only in itself. Taken as it exists, it is always determined by a substantial form and those determinations which flow from extension.

(2) We must especially point out that individual "determination" is not an enrichment nor an actuation, which the form receives. It is, on the contrary, a restriction, a pauperization, a limitation of the specific properties of the form.

Actually, an individual in a species, as it possesses the determinations of its type, exercises them only in a limited

region of space, and for a very short period of time. In other places at other times, the species asserts itself, but in other individuals. No man possesses in himself all ideas, aspirations, merits, in a word, all the perfections which Man can possess. In the same way, no animal, plant nor molecule possesses in its individual being the full realization of the total perfections of its species.

The individualized form is a form limited in its proper perfection. It could not be distinguished from another form in the same species except by a limitation in its specific perfection.

c) The multiplication of the same specific form is understood because of this limitation. Although the form is limited in the individual to a certain region of extension, it can be realized in many other regions as existing and acting there according to its kind, but never according to all the power of its kind.

Thus prime matter, as principle of extension, permits the substantial form, principle of specific properties, to be realized in a limited way. *Limiting* the form in this sense, it *individualizes* it, it *multiplies* it.

Hylomorphism makes the individuality and specific nature of corporeal substance intelligible at the same time. Moreover, its solution respects the irreducible character of both extension and quality. It gives a foundation for their relativity in the absolute substance. It thus avoids the reefs on which mechanism and dynamism founder.

3. THE ROLE OF MATTER AND FORM IN RELATION TO accidents is different depending on whether it is a case of necessary accidents (properties) or of contingent accidents. The molecular weight of water is a property; the temperature 20° C. is contingent to it (Jolivet, *The Notion of Substance*, pp. 53-56).

a. *Proper accidents* find in substance : *their underlying subject* (substance is apt for this " potential " role because of matter); *their final cause* (substance is active because of its form and it is precisely for exercising activity that it has proper

accidents);⁸¹ *their active cause* (it is through the form that the substance produces its properties;⁸¹ matter, however, intervenes as a condition, since these properties demand an extension for their realization).

b. *Contingent accidents* have their *underlying subject* in substance (because of matter) and are *already determined* (because of form). But they are realized through change and therefore demand a cause distinct from substance as underlying subject. Thus the displacement of a bowling ball is possible because of the passivity which is due to the matter, it is realized in function of specific mass which is due to the form, but under the action of an external cause, e.g., the hand of the bowler.⁸³

H. The oneness of the substantial form in one and the same individual is a consequence of its fundamental role.⁸⁴ The form is the first act of matter; its union with matter constitutes an essence apt to exist in itself, an individual substance. From the moment of this union, the essence is complete, and it can receive nothing more as constitutive principle. It is, therefore, contradictory to suppose that several**

“ Substance is perfect only as determined by its properties. In this sense it is their end.

** This production is not achieved in the way of an action, but in the way in which the essence of a triangle necessarily involves, as a consequence, all the properties of a triangle. As soon as a substance exists, its properties are produced in it for the same reason that it is produced.

“ See *Summa Theol.* I* pars. q. 77, a. 6. “ Subjectum (substance) in quantum est in potentia, est susceptivum formae accidentalis; in quantum autem est in actu, est ejus productivum. Et hoc dico de proprio et per se accidente (necessary or proper accident). Nam respectu accidentis extranei subjectum est susceptivum tantum; productivum vero talis accidentis est agens extrinsecum. ” In regard to this, however, it would be good to recall the principle. “ Quidquid recipitur ad modum recipientis recipitur, ” and think, for example, of a local movement which will be received in function of the mass of the receiver.

* See *Summa Theol.*, Ia pars, q. 76, a. 4. sed contra. “ Unius rei est unum esse substantiale; sed forma substantialis dat esse substantiale; ergo unius rei est una tantum forma substantialis. ” Substantial unity comes from the substantial form. Where there is only one substance, there is only one substantial form.

substantial forms determine the same matter at the same time. If it is imagined that they all determine in the same degree, they would constitute so many substantial individuals. If they are said to be subordinated so that there is one which determines the pure potency of matter, then another which determines this first composite (this second matter), and so on, until a final form in which the substance is completed, then this is only an illusion. One conceives the first form as substantial and all the others as accidental, since they can only be determinations which are relative to an individual already complete and capable of existing without any of them. Thus, if I think of a molecule of HCl formed of two atoms, H and Cl, each keeping its own form, I consider the molecule only as an aggregate and not as a single substance. St. Thomas expresses himself very clearly on this subject : " Through form which is the act of matter, matter becomes a being in act and this something : wherefore, that which happens over and above this does not simply give existence to matter, but gives such an existence in act as accidents do, as whiteness makes white in act " (*De Ente et Essentia* ; 1252). Consequently, in substantial changes which make a molecule a composite of simple elements, atoms lose their own substantial form and acquire the form of the molecule which they constitute.

A *question* can now be posed : How do you explain the permanence of atomic properties in the molecule? or in a more general fashion, the permanency in the mixture of the properties of the simple components? Certain atomic properties are actually conserved in the molecule, c.g., atomic mass, spectrum of emission. Moreover, the constancy with which analysis refinds the atoms which have been combined in a chemical synthesis can be understood, only if we admit a kind of permanency to the elements which arc in the composite.

A *first solution* denies substantial change. Thus the permanency of elementary properties need no longer be explained. Yet it seems that this solution must explain how a simple totalization of elements makes new properties appear which experience obliges us to recognize in the compound. Now,

they are new, precisely because they are not a simple total of elementary properties. Thus : (1) an atom has constant properties (weight, volume, electrical charge, light spectrum and X-ray spectrum, chemical activity), which are not the total of the properties of electrons, but an addition to this total of a stable and specific structure. (2) The molecule, in the same way, manifests its individual unity and its specific structure by stable properties, which are irreducible to those of its constitutive atoms. Molecular unity is implied by the law linking pressure to volume with a temperature supposed constant (pressure depends on the number of molecules present in this volume), and by the laws of osmotic pressure (which is the relation between a number of molecules dissolved in two equal volumes situated on opposite sides of a porous division), etc. The specific molecular character breaks out in a multiplicity of properties (solubility, molecular heat) : thus, H_a has for a molecular heat 4.8 cal., while two atoms H_l and H_l have together a heat of 8 cal.; this situation is very clear in the case of isomeres. (3) Crystals have properties which differ according to their axes and faces. Their structure is specific and in no way is it reduced to that of molecules or atoms. We must then reject this first solution, and accept the fact of substantial changes, and the problem as posed.

The second solution admits that the composite possesses a substantial form which the elements do not possess. But here the Scholastics are divided :

Some explain the permanency of elementary properties by the permanency of the substantial forms of the elements, and are content to superimpose on them the form of the composite. This is the solution of Albert the Great and St. Bonaventure in the 13th century, De Lugo in the 16th and 17th, Pesch in the 19th century. But this opinion sees no more in the composite than an accidental modification, and it is truly no more than the first solution, or at most, an implicit denial of the oneness of the substantial form in the individual, which makes any affirmation of substantial unity contradictory.

Others do not admit the actual permanence of the elements and their forms, but only a virtual one. M According to them, the substantial form of the composite possesses the properties of its components and adds to them its own. It disposes the matter in such a way, that, at its cessation, the elementary forms with their properties will appear again. This solution, which is metaphysically without reproach, can not be attacked in the name of science. Science demands that the molecule and the atom should not be homogeneous extensions, but differentiated according to their components. However, it does not exact the permanence of special substantial forms for each part. Accidental determinations (structures, forces, movements) are sufficient.

Thus the substantial form remains one in each individual. Yet the form of the composite is related to the elementary forms. It is " hierarchically " superior to them, •• in this sense, that its virtuality is potent enough to produce not only the properties of the elements, but also those which are proper to it. Thus the elementary properties are conserved, but they are derived from a superior form and no longer from their elementary forms, and they are spread unequally throughout the parts of the molecule and differentiate these parts

° This keeps the essential of Aristotle's and Aquinas's solution. See *Summa Theol.*, I pars. q. 76. a. 4, ad 4. Their solution is an outright assertion of the homogeneity of the diverse regions of the mixed. Scientific experiment teaches, on the contrary, in an incontestable way, the structural heterogeneity of the molecule and of the atom itself. In regard to this, see the diagrams of Laue, in *Témoignage de l'Univers*. of M. GRISOX, pp. 185 ft.

M The hierarchy of forms can be thought of in two ways, as being either actual or virtual. There is an actual hierarchy of forms if several forms coexist in such a way that the existence and activity of one depends on the existence and activity of another. Such a hierarchy — similar to a causal or social subordination — or like to the relation of parts to the whole — is realized between accidental forms. Thus in a living organism, the function of the whole rules the particular functions of the differing individual organs, and in a molecule, the molecular structure assembles and uses the atomic structure. There is no difficulty in this actual hierarchy between accidental forms, but the contrary is true in regard to substantial forms. In regard to them, only a virtual hierarchy is conceivable.

qualitatively. This qualitative heterogeneity is sufficient to explain all the facts upon which some attempt to build a demonstration of the actual permanence of elementary forms (P. Descoqs, *Essai sur l'Hylémorphisme*, pp. 33-72). Therefore no scientific objection can be made against this metaphysical thesis on the oneness of the substantial form in every individual, and as a consequence, no one can break the certitude that there are substantial changes.

But a question still remains. Why are they such? What is their cause?

Fifth Question : What is the *cause* of corporeal substance?

Fifth Thesis : The corporeal *cause* of material substances

1. is *constitutive* :

- a. a preexistent body, offering the *matter*, which is apt,
- b. a substantial *form drawn from the potency* of matter;

2. is *productive* :

- a. a body *effecting* local *movement* and alteration,
- b. an *end determining activities of bodies* in a direction.

A. Notion

1. *Common sense* employs the word very little, but the idea of cause is constantly in mind. Language is penetrated with it. All the "active" verbs express the action of a subject-cause, and the "passive," the action of an object-cause, which is designated by the preposition, by. In the experience of his individual and social life, everyone is aware of influences which are exercised on him. Sensation acts on the current of consciousness and modifies it; and through sensation, the same may be said of customs, laws, institutions, opinions, counsels and examples. However, a *cause* is revealed *from within*,

particularly in a voluntary *decision*. To execute a decision is *to act* and to do, but it is especially to procure a result previously conceived as an *end*. A cause is that which acts, but it is also that for which action is done, that which makes an action tend towards an end. This twofold notion of causality, efficient and final, is applied without hesitation to all the real. The course of phenomena is a criss-cross of causes and effects, because it is movement. That which changes is explained only by its connection with another thing which is its cause, and every cause which produces something is like a consciousness which intends the result produced.

2. *Science* first purifies causality from the empirical anthropomorphism which sees a will behind every change. Then it seeks a way to *measure* it, and from then on, ignores the activity as such. A cause then becomes a *relation of equality* between forms of energy. It becomes purely logical, simply an antecedent which permits us to understand the consequence (the effect), because we can deduce the consequent from it by a mathematical *deduction*. The true name of cause in science is "antecedent." Thus, the total amount of energy remains constant under different forms, and the quantity of anterior energy in change is the cause of the new forms manifested by it, by reason of the equality of the new quantity with the old.⁸⁷

3. *The philosopher* can not fail to observe that measure and its correlative deductions are a very incomplete means of knowledge. He will see in the scientific restrictions brought to bear on the notion of cause, only a method. He will continue to speak of an efficient and final cause. Moreover, he cannot resign himself to a causality which is only a logical one. Undoubtedly, this cause expresses in its final analysis, real relations, for if the real can be understood by way of deduction, it is because its elements, i.e., substantial individuals, are really linked in a causal relation one with the other.

* This is the cause which is called "rational." i.e., capable of being expressed in mathematical form. See *La Philosophie de M. Meyerson*, by M. Gillet, pp. 24-48. This ideal, however, can not be realized in its fullness, limited as it is by "irrational" numbers. See *ibid.*, pp. 59-66.

Consequently, a cause is, for him, "*That which makes a thing to be,*" that upon which an existent depends, and thus, that which makes a thing intelligible. Now, if we begin with that experience of causality which is most familiar and best known, that of manual and artistic fabrication, we will see that four principal realities contribute *to the making of an object*. A clay vase comes about through *a matter*, clay, to which a determined *form* is given. It is made up of a fashioned clay, and these two realities *constitute* the vase. But how and why are they joined, since clay is separate from this particular form?

A potter has taken this clay, *he has acted* upon it, using his hands and his instruments, and he has been careful to apply *his energy* in a *precise direction*, which is present in him in *the idea of the form* to be given to the clay, which in turn belongs to a more general knowledge, that of the potter's art. The potter could propose to copy *a model*, but this model would be only a particular form of the idea which directs his work.

Briefly then, *in the produced being itself*, two principles contribute to making it what it is :

something determinable, something "potential," a matter;
 something determining, something "actual," a form;
 and *outside the produced being*, two other principles, which
 are not less necessary :

something active, yet still potential, an energy, an agent;
 something determining, directing, a final-idea to be obtained.

Therefore we must call that a *cause*, which makes a thing to be :

(1) *that which constitutes* a being as an internal principle;
 (2) *that which produces* a being as a principle distinct from it.
 In each of these two orders, we are led to distinguish between a determinable principle and a determining one. Thus a being depends on *two intrinsic causes*, potency and act, which may be either prime matter and substantial form, or substance (second matter) and accidental forms; and on *two extrinsic causes*, the efficient cause, or agent, and the final cause, or "directing idea."

B. The reality of corporeal causality

1. *is denied* in several ways :

a. Phenomenalism denies all causality. Cause is not a phenomenon.⁸⁸ It is only an illusion due to the habit of expecting phenomenon B, because it has already been perceived as following phenomenon A, which is actually what is being perceived.

b. The Kantian criticism has made of causality an "a priori" category, a mere subjective way of linking successive phenomena in the understanding.

c. Cartesian mechanism denies all efficient and final causality in the corporeal world. *Descartes* rejects every active force. *Spinoza* ruins the very idea of final cause. For him, final cause is a contradiction. The end of an action, according to him, is the same as the effect. To make the effect a final cause is equivalent to saying the effect is the cause of its own proper cause. Moreover mathematics shows the illusory quality of final causes, since they derive all from essences by the pure mechanism of deduction.⁸⁹ *Malebranche* reduces all created causality to what he calls "occasional" "it is contradiction... that bodies should be able to act on other bodies" (*Entretiens sur la Métaphysique*, VU, pp. 5-10). But "God has established a certain modality of occasional causes in relation to effects, which He produces Himself." These causes "determine the efficaciousness of His Will, in consequence of general laws which He has ordained" (*ibid.*, 10).

2. The bases for these systems are *very weak* :

Ad a. The psychological experience of sensation suffices to

» That is to say, an object of experience. Experience shows only positions, successions and displacements. Now experience is the only possible knowledge and nothing is unknowable. Those are the basic principles of phenomenalism.

« See *Spinoza. Ethics*, Bk. I, the entire appendix. "All final causes are only fictions of the human mind.... (The theory of final causes) considers... as an effect that which in reality is the cause, and vice-versa. "

show the intuitive origin and the real value of the notion of cause. To sense a quality is to know its action on me, the reality that is imposed on me.

Ad b. For the same reason as above, we must deny the Kantian thesis, which relegates causality to an "a priori" category, i.e., independent of experience.

Ad c. Again psychological experience furnishes us with a first response to the negation of the mechanists. Intuitive data cannot fail to be real. Moreover, *Descartes* is mistaken: movement is not only local movement, it is both qualitative and active. As a mathematician who reduces everything to necessary deduction, *Spinoza* ignored final cause. Actually this ignoring leads to confusing its causality with the efficient causality of the agent. *Spinoza* knew well that the realized effect does not produce its cause. But in order that its cause produce it, there must be some orientation towards it. Now the final cause is precisely the reason of this orientation in the cause. Wherefore, whoever has the idea of an efficient cause determined to produce a definite result, has the idea of a final cause. *Spinoza* did not see this. As useless as final causes may be to the mathematician, there is still no legitimate basis to deny their reality, any more than there is to deny the right of non-mathematical sciences to exist. The mathematical sciences suppose neither final nor efficient causes, for they are interested only in the essence. But the study of existence and action cannot be reduced to essence, and it is precisely existence which demands finality and efficiency.

Malebranche is mistaken on the origin of the notion of cause. Our idea of an *absolute cause* is derived from an intuitive idea of *relative cause*, of a *caused cause*. Before declaring God a universal cause, we must find causes and effects in this world. If we do not find a cause in the world, what reason have we for looking for one elsewhere since we lack the notion of cause?

3. *Positively*:

a. The intuitive origin of the notion of cause guarantees its reality. Causality is a simple relation and can be attained

only by intuition. It is directly applied to two worlds and, even with some preference, to the external world. The only explanation of this instinctive application is the grasp of this notion in the world wherein it is applied. Without any doubt, my primitive experience bears on my body and those of others simultaneously. That there should be some error in attributing causality to a determined body can be readily understood, but not so readily understood is the hypothesis of constant error, which makes me project a completely internal experience of causality into the world outside of me.

b. Science, certainly, concerns itself with logical causes or reasons. But *logical causality* has no real truth, if it does not express *real causality*. However, even science recognizes real causes, as forming a part of the given world which it seeks to understand. It has admirably transposed these real causalities into logical relations and measures to a very high degree, yet it finds everywhere real causalities, which cannot be so transposed and which Meyerson called the "irrationals": there is action and movement; there is irreversibility in energetic transformations (the law of entropy); excitants provoke sensation without being equivalent to it. It may be objected that God can be the only cause. This could be true, at least in regard to the mineral world. God could be the only cause, but He is not. The logical relations of mathematical causality link bodies to other bodies, and not to God. It is not, as Malebranche thought, a simple divine idea which provokes the displacement of ball B, but rather the divine idea incorporated in ball A which has just struck B. Without ball A, there is no movement of B.

Thus science would be entirely falsified in declaring the causality between bodies as unreal, or even limiting it to that area wherein it can be transcribed in equations of energy.

c. Our belief in the activity of bodies is evidently at the basis of very many of our movements of adaptation in the world. Activity is useful, and therefore it is right. There are cases where it is false, as in magical and superstitious practices. Yes, then it is useless and adapted to nothing. These cases show that we can sometimes be mistaken in our judgments in

causality. They also show that we are not always deceived, and that corporeal causality is real.

What then is the role of bodies in the production of corporeal substances?

C. The intrinsic causes of a corporeal individual which begin to exist at the term of a change of substance are matter and form. How do they cause? They cause the composite, and by reason of that they cause each other, since neither exists except as a constituent of this composite.

1. However, *prime matter* has a preponderant role to play in relation to substantial generation, since it is the only substantial subject which endures throughout the renewal of individuals. It exists before the new individual. We can conceive the total production of a body, i.e., its *creation*, but we are, for the moment, concerned only with the *transformation*, the production of a body as regards its substantial form.

The entire work of nature in bringing new individuals into existence is only a work of transformation. Before these new individuals existed, their matter did. The work of nature endows this matter with a form which is new, whether that be in its individuality alone, as among living things, or in their specific characteristics, as in the case of minerals.

Does matter play its receptive role here in a completely neutral way? Can it become, at this very moment, anything at all, i.e., receive any kind of form? No, it can not. Experience shows us the contrary. There is always a narrow and very definite link between the determinations of matter anterior to its transformation and the specific form brought into existence by that transformation. Mixing hydrogen and chlorine will only give the transformation HCl. The receptivity of prime matter is, therefore, a receptivity already very specifically determined. The word "dispositions" to a specific form may be used here to refer to those determinations present in a material thing at this very moment, which render it receptive to only one kind of form. One can say that matter thus determined exercises in relation to the form which comes into being.

a *dispositive causality*, not in the sense that it gives itself these dispositions, but rather, having received the action of outside causes, it has, because of them, a potentiality oriented to one definite kind of form.

In what do these specific conditions consist? Negatively, in the absence of quantitative characteristics, which are indispensably linked to the continuation in being of the substance which is about to disappear. Positively, in the presence of quantitative characteristics which are contrary to the above and typically identical to the properties of the form which is about to appear. The production of these dispositions involves alteration in the substance which is about to cease. Thus it is a progressive movement, since it directly modifies extension. It endures until the realization of that "ultima dispositio" ad formam, which is the form which involves the instantaneous birth of the new substance.

Thus, the integrity of the external layer of electrons is necessary for atomic individuality. A movement, produced by a luminous vibration, brings H and Cl closer and closer together until their external layers are in contact. Here we have an alteration of atomic structures which is at the same time the constitution of the typical structure of the molecule HCl, wherein the individualities of H and Cl disappear to give rise to that of HCl.

We must make a further precision. Up until now, we have discussed only the specific nature of the new form as it is attached to the dispositive causality of matter. But there still remains the question of how its individuality is attached to matter. Matter, as endowed with undetermined extension, only makes individuation possible. However, in every substantial mutation, we have a matter endowed with a *determined* extension, which receives from acting causes, at a *precise moment* of time, the "ultima dispositio" which coincides with the generation of a new form. Thus this new form contracts, for the full time of its duration, a completely concrete relation with this moment of time and this portion of the world. It is, forever, the form which begins *here and now*, united to this matter. The extension of the composite can vary in volume, in structure, and in a

thousand movements and qualities. Yet these changes will not affect the individuality, as long as there is no mutation of the specific nature, for substantial individuation is acquired only once, and that is evidently at the moment when the substance begins to be.

2. *The substantial form* is the cause of the new substance once it is constituted in "facto esse"; while in its formation, in "fieri," the form is an effect, a term of change. It is *the act towards* which the potency of matter tends, concretely oriented by its dispositions. This relation has been expressed as "drawn from the potency of matter" (*educta e potentia materiae*), at the time of a change.

This metaphor is detrimental, if it conjures up the image of a matter which is like a closed chest filled with forms, liberating them only one by one and imprisoning the preceding at the moment it liberates the following. It simply means : (1) that the form exists at the term of the change; (2) that matter contributes to its existence only as a receptive potency, as determinable subject; (3) but also as an oriented receptivity, by reason of disposition, towards a specific and individual form; (4) that the "drawn" form can exist only as dependent on the matter. •°

Consequently the idea of forms already made, hidden in the matter, which mutation, as if by a stroke of a magic wand, makes appear and disappear, is false. Forms are in matter only in potency, never in act, e.g., the form and structure of the oak are in the acorn; the knowledge of the adult is in the newly-born; the vase, the statue and the pipe are in the clay paste.

The observable laws of substantial change, which lead us to recognize the role of material dispositions, indicate correlatively that not all the forms are in the same degree of potency in concrete matter. Undoubtedly, they can all be actuated one day or another in the course of the history of the world, but then they are only in remote potency. Only those forms whose

•• The human soul verifies the first three characteristics but not the fourth, because it is not only a substantial form, it is also spiritual. Because of that it transcends the limited domain of corporeal beings.

properties are akin to the actual dispositions of the matter are in proximate potency.

D. Extrinsic causes are necessary to the production of the corporeal individual. "Quae, secundum se, diversa sunt non faciunt unum nisi per aliquam causam adunantem ea." Matter and form make only one substance in dependence on a cause which unites them, and which offers for our consideration two different aspects : action and determination.

1. *An active or efficient cause* is required as the cause of change. This cause can be called a motor cause. The transformation is a movement resulting from qualitative alterations and displacements. Now change has no sufficient reason in the mobile, and therefore it must be sought in something distinct from it ("exterior," if you wish, but without any spatial sense). Actually a mobile is a being in potency, passing to act. Now nothing passes to act by the simple reason that it is in potency, for nothing is determined because it is determinable, nor does it become a possessor by the fact that it is not a possessor. Therefore no mobile is changed by its nature alone. This must happen by reason of a being distinct from it, a producer of its movement, a cause, a motor cause.

But what is this motor cause? It is found in bodies themselves. The analysis of sensation, the truth of scientific laws, the biological value of our knowledge of movements, show us this.

Bodies are thus directly causes of change and indirectly causes of existence. Are they adequate causes of existence? Certainly not. They cause existence only as the term of a change. They necessarily suppose a preexisting matter, prime matter if they are substantial, second matter or substance if they are accidental. In any case, bodies are only causes of the new "information" of this matter. They do not make it exist, they suppose its existence.

Will we find in the matter which persists throughout these changes the adequate cause of existence? Not with any certainty in matter taken in its aspect of pure potentiality. How about matter as disposed by causes acting in the universe? This question poses another : "Is the universe the cause of its own

determination. It possesses this determination and is *in act* in regard to its subject.

But we can distinguish in experience itself two ways in which a cause can be related to its effect :

1) A *univocal cause* possesses a perfection specifically identical to that which it introduces into the mobile : a warm body warms water.

2) An *analogous cause* (sometimes called "equivocal"*) possesses a perfection superior to that which it produces : the ideal of beauty, which animates an artist, passes into his beautiful work ; the *-plan of* the architect passes into the materials with which the house is built.

We must therefore conclude :

c. Form and end. " Agens agit simile sibi. " The agent possesses in itself that determination which the mobile does not possess until the term of movement. That which will be the *form* of the matter in the substance produced is already present in act in the agent, but in another way. In the substance produced it will be there as the *term* of a mobile potency; in the agent it will be there in the form of motor activity, in the form of a tendency to communicate itself to the effect, as *term* or *end* of the communicating action. That which will be form at the term of the change is necessarily end for the motor agent. That which is produced is, thus, similar to that which produces. Suppress the *end* in the agent, and by that you suppress the *form* in the substance produced. Therefore, the latter would be, if it could be at all, almost anything.

So we must affirm the existence of ends in nature. They must be as truly in nature as are substantial forms. It is impossible to conceive the universe as a simple total of energies. These energies are always at the service of ends, because they realize, through an indefinite number of changes, definite substantial forms. The latter are undoubtedly a partial but very clear expression of natural ends.

b. Destination and intention. In what way does an end exist in an agent? At the minimum, as a destination or an

order. I think of the many actions of a spider spinning his web, or of the prodigious muscular activity of the bee in the construction of the honey comb, and a certain order strikes my eye. There is in the agent that which produces this order in the action. It is the end present in the agent; it is the unity of the plan of these actions and their result, the destination of the activity.

Outside of my consciousness, I do not perceive end in any other way than I do within it. It is thus that I perceive it in the production of substantial form.

In my consciousness an end appears to me much as it does in the world I observe, e.g., my innate instincts and those psychological structures which appear through no command or wish of mine. But an end appears to me most often under the form of an *idea* which I choose as an *aim* and which I call *intention*. Intention makes me understand destination and the order I place in my actions. It is the first and fullest way to possess an end.

But this is surely not the way, i.e., the first and fullest, that I find operative in all causes.

The problem of the existence of bodies remains to be solved under two aspects. An individual body does not contain the *adequate cause of the production* of another, nor does it furthermore contain the *adequate cause of its proper orientation* to produce. Does the world, considered as an ensemble of all bodies, constitute the full source of existence and destination for all the individuals it contains?

Before coming to grips with this problem, we must consider corporeal life, which, at first look at least, seems to imply original characteristics, surpassing the existence and activity of brute matter. If we neglected this most complex and varied aspect of the universe, we would certainly misconstrue its richness and perhaps neglect data essential to the problem we are trying to solve. Is organic life the answer to the problem of matter? If it is not, then it adds its problem to that of matter and must be taken into consideration even if it complicates the task of the philosopher.

BOOK TWO

LIVING THINGS: ORGANIC LIFE

Is the uniqueness of life real? If it is, in what does it consist? What is the cause of life?

Sixth Question : What is *organic life*?

Sixth Thesis : A living corporeal being is

1. an *individual* body, capable of *immanent* operation ;
2. and therefore *specifically different* from a non-living thing;
3. and therefore, an essence composed of prime matter and a substantial form, which is called *a soul*, and is endowed with a number of *operative powers*.

A. Notion

1. *Empirically*, life is a characteristic common to plant, animal and man. To think, to will, to feel, to be happy, to suffer, is to live. These are elements of human life. To romp, to flee from a predator, or to stalk the prey is also to live. These are elements of animal life. To grow, to bud, to flower, to fructify, is to live, and these are elements of vegetable life. It is difficult to see, at first sight, what among these things that are called life are analogous. We can, however, here note these common traits : one negative, the *irreducibility of life* to mineral *matter*, which the fact of death imposes on us ; and the other positive, the *finality* of life. A living thing seeks to preserve itself, to grow, to protect itself and to perpetuate itself by engendering others of its own kind.

2. *The biological sciences* have for a long time resisted the mechanical method, which Descartes wished to impose on

all matter whether living or not. They are, however, now submitting themselves more and more to this single method. Most biologists are persuaded that the physiological facts are determined in a completely mechanical way by their antecedents, and reveal no more real finality than the physico-chemical facts, among which they seek to classify their observations. Thus, science refuses to concern itself with those two traits, which, according to common sense, seem to characterize life — its irreducibility to matter and its utilitarian finality.

Actually science has sought incessantly to bring life and matter closer and closer together, even to the point of confusing them. The evidence of this basic relation is pointed out in the following :

a. *There is a mechanical explanation of biological facts, which is continually progressing and which shows all organic life as a more or less complex machine.* Thus all common vital functions (nutrition, differentiation, adaptation, reproduction) are movements subject to physical and chemical laws, laws which are purely mechanical. Thus the laws of energy are observed in vital combinations. The quantity of energy in a system (living thing and environment) remains constant; life neither creates nor destroys a parcel of energy, and the equivalencies remain the same : 1 gram of albuminous oxyde, whether outside a living organism, or within the respiration of a living organism, always furnishes 4.83 calories. The laws of osmosis regulate absorption; those of chemical synthesis, assimilation and disassimilation, i.e., all of nutrition; those of attraction govern the phenomena of cellular multiplication, growth, and reproduction. Mathematical probability is applied so well to the phenomena of heredity, that one can predict, according to the Mendelian laws, the characteristics of the descendants from the “ factors ” of the parents. What good does it do, then, to invoke final causality? Such causality offers nothing useful in the explanation of organic life.

b. *There is something akin to the beginnings of life in minerals.* These minerals show phenomena very similar to some which have been thought of as most characteristic of living

things. Thus a mineral has both an internal organization and an external form, as do living things. In the atom, the molecule, the crystal, the structure is as specific as it is in a vegetable. Nutrition and growth are also realized in crystals. The necessity of a crystalline seed to activate the formation of a crystal in super-cooled substances, as glycerine, is similar to the necessity of an egg or of a spore in reproduction.¹ There is an adaptation of minerals to the conditions of their environment, such as temperature, pressure and concentration. Fusion and vaporization are modifications of form, similar to the variations of external size, hairiness, and unnatural growth realized in plants by reason of certain external influences. Even death is realized among the minerals. Catalysts, for example, can be poisoned and become inactive; thus, sulphur is a poison for iron, water for uranium, which are catalysts in the formation of NHS; likewise enzymes are killed by heat, although they are not living. Common sense is, therefore, mistaken in imagining an abyss between life and matter; this abyss does not exist.

In a general way there are not two chemistries, one "organic" and reserved to living things, and another purely mineral. Substances called "organic" can be produced by synthesis from simple bodies, as Berthelot has shown. Excepting the most complex molecules constructed by life, a great number have already been completely fabricated, such as hormones, albumins and proteidos.

It would seem best, then, to define life as a physico-chemical phenomenon which is extremely complex, and matter as a phenomenon of the same nature, but relatively much simpler.

c. *There are intermediaries between minerals and living things.**

1) from the point of view of specific *size*, we find living viruses, e.g., the poliomyélite, which is less than a hundred

¹ A small crystal will grow if it is placed in a solution of the same substance or in an "isomorphic" one.

* See L. L. Woodruff and G. A. Baitskix, *Foundations of Biology*, 6th ed. (New York: Macmillan, 1947), pp. 394-396.

millionth of a millimeter, and we know of non-living molecules which are of a slightly larger size. Here we have a reciprocal overlapping in both domains.

2) from the point of view of *-properties*. We find beings which are chemical because of their molecular simplicity and their aptness to crystallize, and at the same time biological by their power of multiplying and growing through the assimilation of different substances, e.g., the crystallizable mosaic tobacco virus.³

Genes out of which chromosomes are formed are relatively simple grains of proteins (chemical aspect), nevertheless, they contain in germ the hereditary properties of a living thing (biological aspect).

d. *The self-regulating machines* of cybernetics realize effects which are similar to those produced by living beings, even those which are highly advanced in organization.⁴

Every living thing must realize an equilibrium between its numerous functions, and between those functions and the conditions of its environment (adaptation). This equilibrium is necessary for the realization of a definite program, but variable between the fixed limits of a specific minimum and a maximum. Now, the electric turtle imitates tropisms and elementary reflexes; the electronic computer succeeds in mathematical operations much more quickly and accurately than man. The homeostat of Ashby, in which there are some 400,000 possible combinations which it can attempt, appears to find the conditions of its equilibrium, and to realize them with a sure stroke.⁵

All these similarities which experience suggests and imposes between living and non-living things, constitute a powerful temptation to declare them identical. This temptation is so

³ Chemical synthesis has succeeded in making this virus. See *Science et Vie* (January 1956). P- 86.

⁴ W. Ross Ashby, *Design for a Brain*, 2nd ed. (New York : Wiley & Sons, 1960), pp. 1-12.

⁵ *Ibid.*, PP- 58-70-

much more powerful because the scientist seeks a maximum unification of data, and does not understand unless he has succeeded. It is still more dangerous, if the scientist attempts metaphysics without perhaps knowing it, and doubles as a scientist and philosopher, while accepting scientific method as the only legitimate knowledge, which will unveil all mysteries and decipher all the enigmas of the sphinx which is nature.

3. *The philosopher* will have no great difficulty in placing the problem in focus. He admits all that the scientist has observed, which indicates a close relationship between the metaphysical structures of the living and non-living. Yet he must quickly point out that the scientist ignores, by his method, that which makes life specifically different from non-life, as is evident in this remark of Claude Bernard : " Life is nothing more than a word which denotes ignorance. When we qualify a phenomenon as vital, this is equivalent to saying that it is a phenomenon whose proximate cause and conditions we do not know" (*Inir. à la Méthode Expérimentale*). But Bernard sees in this only a methodological position. If science is defined as knowledge of a phenomenon through its antecedents, then that which is not explained by these conditions is not " scientific, " and it is to be ignored. A question still remains to be discussed : Is life explainable by its antecedents alone? If the answer is yes, then one day science will explain it entirely by mechanical reasons. If the answer is no, then there will always remain something in life which is inaccessible to mechanistic science, and which we must, like it or not, recognize as irreducible to the physico-chemical.

To pose this question, we must indicate the limits of life. It is a question of that which is common to all living things. But in order to describe it, we must take into consideration scientific experience. It first distinguishes between psychological and physiological life. Then it recognizes in physiological life an ensemble of functions common to all living things, despite their different manners of realization. A corporeal living thing, such as we envisage it, is *a body which nourishes itself, grows,*

adapts itself and reproduces itself. • This definition embraces man, animal and vegetable, but it extends only to the vegetative functions in all living bodies.

B. The originality of life thus understood consists in an *immanence* of operations. The vital phenomena common to all living things actually suppose *actions of which the living thing is at the same time the cause and the term.* They are spontaneous, and they change the living thing. A living thing is then capable of changing itself, " *ens capax se movendi*, " capable of immanent operation, i.e., of modifying the operator itself.

Proof. 1. First, the living thing *is a cause* of the phenomena of vegetative life. Undoubtedly, it is not the unique cause of them, and its spontaneity is not absolute. It has need of food, and more generally, of its environment. The growth of a plant is conditioned by the quantity and intensity of warmth, by the physical and chemical nature of the soil, by humidity, light.... But the living thing is the cause, and the most necessary cause, of its proper life.

To nourish itself is to fabricate a specific albumin through a chemical activity oriented specifically in that direction, and to incorporate it into its cytoplasm, nucleus, and cell walls.¹ *To grow* is to proceed by multiplication and specific differentiation towards a cellular form, towards a structure, each of which is a

* Each one of these functions implies multiple components. Thus nutrition, which is basically assimilation, embraces other elementary functions, such as digestion, circulation, and especially breathing. Would one of these functions be sufficient to characterize a thing as living? Certainly not. Even breathing, although very fundamental, is not sufficient: for example, crystallized hemoglobin incorporates and gives off oxygen or carbonic gas.

Some think that the tobacco Mosaic virus is not alive, because it does not breathe although it assimilates.

¹ It is remarkable that organic chemical function always tends to differentiation. It mixes the stable with the unstable, the highly complex with the simple. The functions of inorganic chemistry tend to level off, obeying the principle of Carnot, breaking down the complex, reducing the differentiated to the homogeneous and the unstable to the stable. The inorganic tends to the simplest and lowest level, whereas life operates in a counter direction, like an indefatigable Sisyphus.

distinct reality, revealing a power of specific evolution in a living thing which no external condition supplies. *To reproduce* is to differentiate certain cells⁸ and render them apt for transmitting the same specific life by communicating to them a kind of specific potentiality, which the development of the egg or of the spore will bring to full light. This very special determination of certain physico-chemical groups, the chromosomes, is the most stable factor in a living thing, to the point that any modifications acquired by the individual, e.g., habits, do not seem to be able to be transmitted by heredity (L. CuÉNOT, *La genèse des especes animales*, pp. 224-270). *To adapt itself* is to modify its nutrition and growth in a way that makes the best of the conditions in the environment. Adaptation supposes very evidently the action of the environment on the living thing. Nevertheless we must recognize in the living thing itself an indispensable cause of adaptation, for the same external causes produce different effects according to the species which undergo them ;⁹ thus external causes are not the adequate explanation of adaptation. Briefly then, the general phenomena of the vegetative life are not explained without a *spontaneity proper to the living thing*, which is undoubtedly influenced by excitations coming from the environment, yet reacts to these in a specific way.

2. A living thing is also the *immediate term of vegetative change*. Without any doubt, a growing root can crack a rock, and forests can create a special soil. In general, life modifies its environment, and the evidence is rather obvious. However, the immediate term of life is not these modifications of environment. What is immediately, always and necessarily changed by vital phenomena is the living thing itself.

In *nutrition*, this is quite clear. The living being constructs and rejuvenates its cellular matter. In *growth and differentiation*,

"The causal role of external influences in reproduction takes many forms (we can here think of pollenating insects), but the essential cause of it remains the generator.

• A particular race may be immune to a particular virus, while another race is killed by it, and still another adapts itself to it and acquires immunity.

it is still very clear. A vegetable increases the volume of its roots and its absorbent surfaces in the soil. In general, a living thing builds its specific structure little by little, realizing it according to a plan which is most obvious to the experimenter. *Adaptation* is still clearly immanent. It is realized by the exercise of vital activities. What is modified is the play of life itself, making it, for example, easier and more fruitful. The phenomena of *generation* manifest immanence less clearly. They evidently tend to the constitution of a new individual. Here the living thing is not closed in on itself; it tends to give of itself, and even to devote itself in many cases. Thus generation is often accompanied by the death of the individual parent (annual and biennial plants and many animals). One gets the impression in these cases that the most precious thing is not the existence of the individual, but the preservation of the hereditary type represented by the individual. We will discover immanence under the form of biological interest in the species. The species never works more clearly for itself than in the phenomena of generation. In every hypothesis, generation is realized by the individual, and generation modifies the individual first of all by cellular and humoral transformations.¹⁰ Generative phenomena are therefore immanent, even if their utility goes beyond the individual.

Consequences. The immanence of these operations allows us to understand some of the experimental characteristics of life and to find in them a kind of supplementary verification.

Since life is immanent, it demands for its exercise a complexity, an organization. It would be contradictory for a simple being to be cause and effect at the same time. That which is causing in a living being must be really distinct from that

¹⁰ The reproductive function consists essentially in the formation of gametes and spores, and not in the appearance of a new living thing. There are particles of pollen and there are spores which actually never reproduce. ... nevertheless they have generating power. They have acquired it, and this acquisition lies in the formation of pollen and spores, which is nothing more than a cellular modification in certain regions of the generating organism. Often this first immanent effect is followed by no other (this other [generation] is a transitive effect).

which is caused, yet it is necessary that both be one and the same substantial *individual*. Thus the necessity of *organization* in a living thing! Whoever speaks of organization speaks of a qualitative difference of parts belonging to one and the same being. Organization permits the individual to act on others through one of its "organs" (or differentiated parts), and thus to modify itself.

Since life is an immanent activity, it is *able to enrich itself or diminish itself* by its own proper play. A living thing keeps its act as something acquired. It is *capable of habit*, which either heightens its life (as an acquired immunity) or lessens it (as in anaphylaxis).

Life then has *duration*; its past is not absent from its present. It is continued in it.

Immanence supposes and demonstrates *the individuality* of a living thing. That which endures has a substantial base. The living thing shows its individuality in an *activity which directly profits only itself*. Biologically speaking, life is *egoistic*. The facts of generation reveal this as being more of an egoism of the species than of the individual, and perhaps the consideration of the universe will show us, beyond this, a "cosmic egoism" dominating all others, and leading us to God, "the Common Good" of the universe. However, these vaster egoisms do not exclude individual egoism. They suppose it. Life enriches the universe, only because it adds to mineral existence an individual interest, and if the species progresses, it is only in individuals and because of them.

Life is, therefore, a basically individual characteristic. The individual is revealed by the *immanent finality* of its operations. Its vital acts are first of all for itself. Here finality consists in a destination. All vital movements have for their sole, immediate and necessary result the change of the individual itself, which produces them by its own spontaneity. This finality is *not always utilitarian*. Its term is not always the greatest good, nor even the good of the individual. It can happen and it does, that, through the transitions of the individual, by its wearing out, by its death, the good of the species is restored

because of the individuals engendrad. Now, if the evolution of species is admitted, there can be, through this chronological succession, a conservation of and a variety in the living world (of the biosphere). Whether useful or not, vital finality is, in any case, the determination of vital facts to modify the living thing itself, a finality immanent to the individual itself.

C. The irreducibility of life to physico-chemical phenomena is drawn from its characteristics. Atoms, molecules and crystals have no immanent activity. They gain nothing in exercising their properties. The movements which they are subject to, leave no trace in them. Take a block of steel and heat it to a molten state, then cool it, and it will be found to be identical to its former state, not having acquired the least facility to be more readily warmed than it had before. Physico-chemical phenomena do not have true duration since their changes are reversible. A living thing, on the contrary, finds all the past written into it, and it is never such that it could be what it is, if it had lived otherwise. A mineral has no history, but a vegetable has one. A mineral is incapable of habits, but a vegetable acquires them in adapting itself. Briefly, the action of a mineral is completel}' "*transitive*." It changes only the individual which is distinct from the agent. The activity of a living thing is *immanent*. It changes itself in the exercise of its own vital powers.

This is not to deny a relationship between the living world and the mineral one. The living world and the mineral world are both subject to external influences. They possess common properties and obey certain identical laws, and arc, in a word, of the same genus. This relationship permits us to understand the incessant passages from matter to life and the contrary phenomena of disassimilation and death. It permits a legitimate basis for a mechanical explanation of life, since living matter is subject to the laws of all matter. But the living thing contains in itself a specific orientation, which can not be expressed by mechanical laws, and which is also factual. Life is then something other than a physico-chemical phenomenon. Living bodies are a family specifically different from minerals.

1. But *one can object* that the mechanical explanation of life given by science has been highly successful. This explanation clarifies only the general functioning of material organs, but halts before the threshold of life itself. Thus it marks the conservation of energy in the exchanges between the living thing and its environment. Yet it states — without explaining why — that life differentiates energy into a thousand completely improbable forms. E. Guye has calculated the probability of the mechanically spontaneous formation of a single molecule composed of two kinds of atoms, having a molecular mass of 20,000 and supposedly dyssymmetrical. He has found it to be equal to 2×10^{-321} , i.e., to 2 divided by a number formed by 1, followed by 321 zeros. Now the simplest cells contain not binary but quarternary molecules in the hundreds of millions and in a superior mass, 34,500 (the mass of pure albumin). All of which diminishes the above probability to unimaginable proportions and reduces it scientifically to nothing.¹¹

While the inorganic tends toward a total symmetry, toward a complete leveling of energy (as the law of Carnot-Clausius and the calculations of Boltzmann have shown), the organic, ever since it began, perhaps a billion years ago, has not ceased to manifest itself as more and more dissymmetrical, differentiating itself into always new species. ”

2. *It can be further objected* that the resemblance of certain mineral facts to the most characteristic vital facts, shows a possible reducibility. No one denies this resemblance, but it is accompanied by this difference, that the vegetable realizes these phenomena at the same time *from within* and *by itself*, whereas at least one of these two conditions is lacking in the mineral. Thus the mineral *does not organize itself*; it is already organized. An elementary crystal *does not grow*. It attracts other crystals similar to itself, which remain individually distinct. Thus is explained the usefulness of a crystalline germ. It sets up the

¹¹ See Lecomte du Noüy, *Human Destiny* (New York : Longmans, 1947), Bk. I, ch. 3. pp. 33-39.

¹² *Ibid.*, Bk. I, ch. 4, pp. 40-52.

attraction, but there is nothing here which resembles the germination of a spore, much less the formation of the spore itself. Minerals *do not adapt themselves*: their gaseous, liquid or solid state is imposed on them by external conditions and consists in varied groupings of individually distinct molecules (except in cases of polymerism). On the contrary, vital adaptation is realized in the individual itself, and it modifies its own characteristics by virtue of its own spontaneity. *Death* is an idea which can be used literally only in regard to the cessation of vital activity. It can not strictly be used in regard to the cessation of all activity. Death is irreversible. On the contrary, a catalyst can be regenerated by a proper purification.

3. *A further objection* seeking to establish the reducibility of life to matter will stress the existence of intermediaries between living and non-living things. The argument drawn from size can be neglected, for life belongs to quality, not to quantity. As to the biological properties of certain individualities (crystallizable virus, chromosomic genes), they certainly indicate the presence of an aptitude for life. As for the rest, an aptitude of this kind can be found only in the process of vital assimilation, wherein molecules of food become living, after they have lost their individuality in the individuality *of* the living thing.

But this is not the only elementary function by which we can scientifically recognize life. It is done rather through an ensemble of functions. One can imagine a chemical molecule capable of multiplying itself at the expense of an environment which would not be too dissimilar to it. This phenomenon would resemble vital assimilation in about the same way that the growth of a crystal does in a solution which is of an identical nature.

What exactly happens when tobacco is invaded by mosaic virus? Scientists discuss this. Does the virus breathe? Is it truly alive? No. But is there present at least that fundamental property of life, assimilation? Probably yes, but this remains doubtful. Its "multiplication" could be only a chain molecular reaction, made possible by the chemical functioning of its host.*

* L. L. Woodruff, *Foundations of Biology*, p. 395.

At any rate, the virus cannot live except as a parasite, and therefore cannot be a bridge between non-organized matter and life. At most, it is nothing more than a degraded form of life, the witness of a long biological history.

4. There are some who see in self-regulating machines a reason for reducing all living matter to mechanics. Don't they imitate living things in the way they seek and realize an equilibrium, despite the variations of their external and internal environment?

Yes, they imitate vital activity. But what can be concluded from that? (1) That *man* is able to construct machines which imitate nature. (2) That there must be in nature and in its Cause the equivalent of that aim which man has before him in constructing the machine, a kind of active idea which endows a living thing with a defined program and the means apt to realize it. (3) Briefly, there is in the living thing as in the machine, an incarnated finality as well as a differentiation of energy.

Moreover, the imitation of vital activity is imperfect. Actually :

a. As supple as the machine may be, it never builds itself up. The living thing itself constructs its organs. This, according to the theory of evolution, is what each species has done; this is what every individual has done from its beginning as a microscopic cell. It has multiplied its first material, then differentiated its tissues, assembled them into organs, and grouped these into apparatuses. This prodigious work of construction, according to an invariable plan, unfolds from a gamete whether considered before or after fecundation.

b. The machine offers science the service of helping analyze the work of life. Doing this, it always simplifies, since ■vital function is infinitely more complex than that of a machine, and this is true as the biological organization becomes greater.

c. The machine is only an accidental whole, the unity of whose parts is confined to a structure destined for some function. A living thing, on the contrary, is an essential whole, an " unum

per se," one substance, whose organs are not the pieces of a machine because they have life only by the unity of their existence.

The "survival" of tissues or of separated organs, and even their specific development, can be achieved. Is this an exception to the hegemony of the whole over the parts? No. "This shows that the rupture of continuity between a group of cells and the rest of the organism does not necessarily involve death, but that it can, on the contrary, actuate the potentialities which, existing before the separation, were held in a state of subordination to the whole. The influence of isolation may be clarified by the following: the egg of a triton (water salamander) arrived at stage 16, can furnish 16 separate embryos, through the separation of 16 blastomeres from the egg. Each blastomere is called "totipotent." If the blastomeres were left united, they would have formed only one embryo. Totipotency ceases more or less early according to the species involved, sometimes at stage 2. What is true here for the whole, is true also for the organs or groups of organs. Certain groups of cells contain in potency a whole organ, but they can be substituted for each other in its construction. This rule in the formation of cells, showing their subordination to the whole, is one of the clearest manifestations of the substantial unity of a living thing. It would be useless to explain that nothing analogous to this is encountered in a machine.¹⁴

Let us leave it to science to point out all of the resemblances between matter and life. Despite all that, science has absolutely no right to deny the proper character of life. It has, at most, by reason of its method, the right to ignore it. It ignores the *individuality* of life, when it reduces the living thing, through its analysis, to molecules, and then to atomic and sub-atomic particles, or when it compares a living body to an aggregate of molecules. It ignores the *finality* of life, when it sees in it only a purely mechanical linking of events, and its *immanence*, when

¹⁴ See *Science et Vie* (February 1955), p. 45.

* See L. L. Woodruff, *Foundation of Biology*, pp. 403-467.

it thinks only of events without situating them in the individual which makes an original unity of them. Science ignores all this when it searches for a mechanical explanation of life. Yet it finds all this again when it returns to the living thing itself. The more it pushes the mechanical analysis of it, the more it finds life dominating the physico-chemical, and the more it finds life related to the psychism of the idea directing action.

A living thing is an individual endowed with immanent finality. That which distinguishes it from the non-living is neither its individuality, nor finality in general, but the immanence of that finality which directs its action to the transformation of the individual.

D. The substantial nature of a living thing is, therefore, *specifically distinct* from, and *generically similar* to, that of a mineral.

1. *Matter and form.* It is by a substantial principle, and not an accidental determination, that a thing is living. But the *form* is a principle of specific determinations in bodies. Therefore it is by its substantial form that a body is living.

2. *The soul.* For a good reason a special name is reserved for that form which is the principle of life. It is a "soul." We can define it with Aristotle as "*actus primus corporis PHYSICI ORGANICI, POTENTIA VITAM HABENTIS.*" It is the substantial form, "*actus primus,*" and there you have it placed in its genus; it collaborates with prime matter and constitutes with it a body, "*corporis.*" It exists only in natural bodies, "*physici.*" Aristotle does not think that life can be produced artificially, but in any case, it is never encountered except in natural bodies. The living body is an organized body, "*organici,*" i.e., differentiated. The smallest protista (unicellular vegetables and animals) show an organization which is amazing in its complexity. This body, finally, possesses through a soul the power to act vitally, "*potentia vitam habentis*": "vita" here designates not the existence of the living thing but vital phenomena, life as lived, "life in second act."

3. *The hierarchy of forms.* It almost goes without saying that souls, vital substantial forms, are superior to mineral forms. Souls themselves are hierarchized : some are vegetative, others sensitive, and finally some are rational. This hierarchy is not that of a plurality of forms coexisting in the same individual (See p. 121 ff.). That which is expressed by the idea of hierarchy is the inequality of the virtual richness of forms, their properties. In this sense, the form of the molecule is superior to each of the forms of the atoms making it up, as well as superior to all of them taken together, for it is the principle of the permanent atomic properties as well as of those which are strictly molecular (see p. 123). Again, the form of a very complex molecule, such as the albumin of the vegetable, is superior to the forms of simpler molecules which chemical analysis produces. "A fortiori," the substantial form of a living thing is always superior to the forms of different molecules whose presence is able to be detected in this living thing by virtue of their properties. It is by virtue of this living substantial form that all the properties of inferior forms exist, and it is from it that all the parts of an individual living thing receive a common immanent orientation. Here then is the sense in which a vital form is hierarchically superior to mineral forms. It possesses their powers virtually, as it possesses its own property. It utilizes their powers for itself to the point that it cannot exercise its own except it exercises theirs. Thus assimilation is possible only by reason of the physical and chemical properties of minerals. In the same sense, the forms or souls of vegetables are inferior to those of animals.' Sensation is possible only in an organism which is already differentiated and constructed through nutrition. That is why the soul informing matter has the same properties that were previously the functions of the substantial forms of molecules, which are now assimilated into a vital organism. This is why the animal soul fundamentally endows matter not only with sensibility and motor-activity, which are proper to it, but also with the nutritive, the differentiating and reproductive powers which are characteristic of the vegetative soul, as well as the physico-chemical properties, which are indispensable to the exercise of these powers.

The virtual *hierarchy* of forms is the *consequence of the oneness* of the form in the individual, for it is a single form which must be the principle of all substantial determinations. Yet, how can we conceive the *multiple virtualities* of this single form?

4. *The operative powers.* St. Thomas, in line with Aristotle, conceives the soul or the form as a principle of many "operative powers" which orient it towards acts of a determined kind. These are "potencies," i.e., realities, which are in some way still undetermined. (1) They are identical, whatever may be the intensity or numerical diversity of their actions; (2) they exist even when they do not act; (3) to come into play, they need an excitation or a "motion." They are "operative" because they are oriented not only to receiving a motion, but to acting, to operating, once they have received it.

The vegetative soul possesses three powers: the nutritive power, the power of growth and the generative power. There must be distinct principles, different orientations, in vital spontaneity, since it is a source of varied actions: "powers (potentiae) are specified by their acts." For example, the soul as principle of nutrition can not be totally identical to the soul as principle of differentiation, for different effects are not explained in the same way. But the soul is in itself simple and one in each individual. Therefore, it must be diversified in its relative determinations. It must be endowed with *multiple activities*, in order sometimes to act, sometimes not to act, or to act here according to such an orientation, and there according to another.

Must we insist on the *real plurality of powers* in the soul? The principle, "Powers are specified by their acts," is incontestable. But do we have distinct kinds of acts? This does not at all seem doubtful. Nutrition, or better, assimilation, pertains to the chemical constitution of cytoplasmic and nuclear molecules; growth pertains to the acquisition and maintenance of the specific structure of cells, organs and the entire organism; reproduction, beyond the cellular differentiation of gametes, pertains to the transfer of a specific life to another individual. It seems that a fourth power ought to be joined to the above

ones, at least in the cases of Metaphyta and Metazoa, and that is a differentiating power pertaining to the progressive acquisition of characteristics proper to different kinds of tissues and organs, which is something quite different from specific growth.

The powers are not only distinct from one another, but they are also distinct from the soul itself. The reason for this is that accidents are distinct from substance, determinations are distinct from the determinable, and multiplicity from unity. Now the powers are oriented to action, and the soul to basic existence. The powers determine the soul, and make it apt for its functions in organized matter. These powers are multiple, and the soul is one.

We must take care, however, not to imagine nor conceive this distinction as being one between two substances or two things. There is only one thing, the living body. Its soul, its powers are not things, but principles of a thing — one being substantial and the others accidental. To speak of powers of the soul is to express the riches which it possesses as the first principle of life, and to say that it is the source of a multitude of operations, which it makes possible through the various orientations of its spontaneity. *In this multiplicity* of powers, there yet remains *unity*. Powers actually flow from the soul in a certain order, an order of causality and finality. The nutritive power, for example, is demanded as a condition for the function of the power of growth, and the power of growth is seen as a necessary condition for the power of differentiation, and, finally, the power of generation supposes all the others (Cf. *Summa Theol.*, Ia Pars, q. 77, a. 1-7). The powers themselves are possible only by reason of physico-chemical forces. This order of "emanation" allows us to understand why a single soul may be equivalent to all the inferior forms and go beyond them in virtuality.

E. Some differing conceptions in regard to life

1. *On the subject of the finality* which characterizes it. Of what kind of finality are we speaking?

a. Can an external finality describe life? Instinctively man makes himself the center and the end of the entire universe. Mineral matter seems to him as made to prepare for and to maintain organic life, and this latter to prepare for the arrival of humanity, and then to nourish and serve the physical life of man.

Organic life serves man's intellectual education, by showing him, sometimes in striking relief, the directing Idea which guides it, and the Power which produces and sustains it.

No one doubts that man requires organic life and a material universe. But if this finality appears as the only reason for matter and life in general, it does not seem to explain the host of species whose use to man is at least problematical, if not absolutely deniable, e.g., nebulae that must forever remain unknowable, or parasites which cause epidemics. Moreover, the definition of life by a finality external to the species themselves does not indicate the difference which situates life well above matter, no matter how indispensable the external finality of things may be to man. If man knew no other species than his own, which he considered the very epitome of organic life, he, nevertheless, could not make a logical conclusion that this was so.

In every way, then, it seems that life must be defined by its immanent function in relation to matter, and as a search for individual utility.

b. A conscious finality of its aim and the means thereto seems to be affirmed sometimes, as in *Souvenirs Entomologiques* of Fabre, and in *Physique et Métaphysique de la Vie*, by Professor Remy Collin.

Their anthropomorphical formulae must not be taken literally. They are useful in clearly evoking the role of finality, which, of course, is in no way perceptible except to man. These formulae have thus an analogical sense: every living being possesses in itself *the equivalent* of what in us is the idea chosen to be put into execution. It is, especially in ontogenesis, an "idea which is realized." But to make these men say that

all living things think their ends, choose the means thereto, and execute them, is an error.

c. Internal finality can be thought *of* as a simple relation of utility.

It consists in the usefulness of each organ to the whole, and of the whole to the organs. Such is the position of Kant : " An organized production in nature is that in which all is reciprocally means and end. " Such is also the thought of the biologist, who, as preoccupied as he may be with mechanistic explanations, conceives a living thing as formed of organs useful for the life of the whole, and the whole as necessary for the life of each organ.

This definition is certainly objective, but : (a) Kant reduced it to the role of a provisory method, the unique definitive method being that of mechanical causality; (b) finality is limited to utility, with the presumption that the vital whole is useful. The facts which lead the individual towards death, are they never of a vital origin? The excessive development of hypertrophic * organs, e.g., the antlers of a deer, a peacock's tail, are these useful to the individual? What is served by the coloration and form of flowers or a butterfly's wings?

The biologist, whose vocabulary is very finalist, speaks of rudimentary organs ¹⁷ as organs which are more and more deprived of utility by their state of atrophy. His conviction that an organ must have a certain utility is one of the reasons upon which the theory of evolution is based. Thus an organ, which is useless to this particular species, was useful in the past to the ancestral species, and an organ scarcely apparent now in this species will be useful in the future of this species, and the future is in a sense " prefigured " by its budding appearance. Must we conclude from this that every organ, every detail of structure, has some utility? No, we can only conclude that

* *Hypertrophy* is the development of an organ to such a point that it becomes useless or even harmful.

¹⁷ In man, we can point to the appendix and the muscle attached to the external ear.

the hypothesis of utility is a stimulant to biological research. It therefore is involved only in the method of the science. Here is the thought of Kant : internal finality does not so much express the proper characteristic of living things as our human way of studying them.

It remains true, however, that *individual utility* can exist only in living things, and, in this sense, it authentically characterizes life, but this is because life shows the existence of immanent operations, of an internal finality whether utilitarian or not.

d. Finality without purpose, such is, for Bergson, the typical characteristic of life.¹⁸

According to him, vital finality does not consist in the " realization of a program spelled out in advance " for each and for all, such as Leibniz imagined to be in monads. Nor does it consist in the " joining of all of the parts for the greatest good of the whole in which there seems to be some intelligent organization in view of that preconceived end. " In both of these cases nothing would be truly new. Now, " a free act is incommensurate with the idea... such is evident from the nature of our internal evolution. Undoubtedly, this is also true in the evolution of life. " The essential of vital finality would, therefore, be the indetermination according to which the future is contained in the present. " We would like to assign a purpose to life, in the human sense of that word, but it is in vain. To speak of a purpose is to think of a preexisting model which has only to be realized.... A plan is a term assigned to a work; it closes the future whose form it designs. Yet the opposite is true, for the gates of the future remain wide open before the evolution of life" (*Creative Evolution*). Life is like the imagination, which invents in such a way that the present does not contain in a definite way the realization which it initiates.

¹¹ H. Bergson, *Creative Evolution*, Eng. trans. H. Mitchell (New York : Henry Holt, 1911), pp. 251-271, 272-314. See also J. Maritain, *Bergsonian Philosophy*, Eng. trans. Andison (New York : Philosophical Library, 1955), pp. 74-84. See also M. Grison, *Problèmes d'origine* (Paris : Letouzey et Ané, 1954), pp. 161-165.

Certain facts show this inventive character of vital finality better : (a) those wherein " life fabricates *identical apparatuses in different ways*, " e.g., the eye of the mollusk and that of a vertebrate; (b) *heteroblastic* phenomena, wherein an organ is repaired with the aid of tissues differing from those which served in its formation (the case of the crystalline lens of a triton, which has an exodermic origin, being repaired by the tissue of the iris, which has a mesodermic origin); (c) the facts of *orthogenesis*, that is, continued progressive differentiation within one species throughout the course of evolution, e.g., the ancestors of the horse.

This conception takes care to point out the opposition between matter and life. However : (a) it is too narrow, for life does not always invent. It conserves as well. Must we declare the factors governing species to be pure mechanism, and limit life to the evolution of the species? (b) It falsifies the notion of finality by confusing it with that of indétermination. It is true that indétermination is the condition of the exercise of choice in human liberty, but it does not constitute finality, for finality is not able to be free. When it is, it supposes always a cause which is oriented, a determination, which liberty is held to complete in the same line. If life invents, it is because it carries within it a need, a tendency, in a word, an already determined finality, (c) This " indétermination " does not by itself distinguish life from matter. The Brownian movement of a molecule or of an electron is as indetermined as the thrust of evolution in a given species. Moreover, it is impossible to say if the indétermination is real, or is just an instance of our ignorance of individual cases, or an insufficiency of knowledge to predict an historical fact.

Thus Bergsonian finality describes well enough the contingent, groping character of evolutionary movement, whose present state never allows us to foretell with certitude the following state, although it is carried towards it effectively. This description expresses the weakness of our intellectual penetration rather than the internal nature of vital evolution. Moreover, it concerns itself more with the development of the

“ biosphere ” (the ensemble of living things distributed in time and space), than it does with the individual life of each of them. It attaches itself to a quasi-metaphysical source, “ l'élan vital ” (vital impulse).

2. *On the metaphysical nature of life*

a. The animism of Stahl (18th century) endows the living thing with a *thinking soul* which conceives and realizes purposes. Remy Collin accepts this opinion when, after having defined sensation as “ obscure and unconscious knowledge... of a specific form and its material conditions, ” (*Physique et Métaphysique de la Vie*, Second Part, ch. 3), he identifies sensation with soul and states : “ The psychism which the organized matter of a living thing has as its condition, is at the same time the necessary condition of all living material organization ” (p. 95). Bergson, also, makes his “ vital impulse ” a principle of all organisms, and places that principle in the psychological order.

b. Vitalism contents itself with a *vital principle* which, without being psychological, is, nevertheless, distinct from physico-chemical forces, and because it is a force superior to mechanical energy, it is completely “ sui generis, ” and produces organization. This was the thinking of the school of Montpellier in the 18th century, following Barthez. In the 19th century, this line of thought was followed by a number of German biologists, Driesch in particular, as well as by F. Houssay, for whom life restored the energy which is constantly being diminished in the physical world.

c. The organicism of Bichat finds its source of vital facts in the organism. Life is nothing more than the result of the properties of tissues and of organs, which are irreducible to mechanical forces.

d. The materialism of Haeckel sees in organic life, as in consciousness, only a mechanics of atoms, and by an odd twist makes them the property of all matter.

to conclude : Aristotelian hylomorphism is an original animism, for it places no consciousness, no knowledge in the

vegetative soul. It makes of it only a source of operative powers with a multiple and regulated finality. This finality is not a finality of intention associated with free will. It is destination. This destination (purpose) it not necessarily oriented to the utility of the individual, nor to that of the species, nor to that of the universe. It remains an immanent finality. The purpose of the vital operation is to change the living thing itself which operates.

Seventh Question : What is *the cause of a living thing*?

Seventh Thesis : The cause of a corporeal living thing is a *living thing of the same species*.

A. The fact. There is *no spontaneous generation*, nor is there *any equivocal generation*.

1. Common sense, science and philosophy up until the 19th century admitted the existence of spontaneous generation in this sense that living things began to be without parents from a matter without life. Putrefying meat seemed to change into maggots and flies. The presence of worms in the liver, the muscles and the brain, was still explained in the 17th century by a decomposition of these organs (equivocal generation). St. Thomas distinguished between the higher animals, which could be born only of other animals of the same kind, and other lesser animals, which could be engendered from putrefying organic matter or rise spontaneously from inorganic matter (*Summa Theol.*, Ia Pars, q. 71, ad 1um and q. 72, ad 5^{um}). Every philosophical effort was bent to assign a cause to these generations. For St. Thomas, it was the power of a celestial body, the sun, for example, which replaced the normal generating power.

2. A more attentive scientific study destroyed this legend. It discovered a living generator in every case where a superficial

look saw only organic decomposition or inorganic matter. For example, Van Bénéden (19th century) discovered the cysticercus of parasitical worms. Spallanzani observed the latent life of numerous little organisms which were able to subsist through very unfavorable conditions. However, in 1858, Pouchet believed he had demonstrated that infusoria were spontaneously generated in a liquid previously sterilized by boiling. Pasteur demolished his conclusions by well constructed experiments.¹⁰ Since then, this fact, that every living thing comes from another living thing, has not been doubted by any scientist. It has even been put more precisely: Every living thing is born of a living thing of the same species, if species is defined biologically by hereditary characteristics.

Such are the known facts. We do not know of a single instance of spontaneous generation. We do not know of a single instance of generation where the generator and the generated were of different species.

Are there unknown facts? The scientist cannot say anything about them, since he does not know them. Pasteur, himself, says of his experiments: "I do not pretend to have established that spontaneous generation never existed. In subjects of this order, we can not prove the negative." ²⁰

As for the generation of a being of another species than that of the generators, the majority of scientists hold this to be real, since the theory of biological evolution, generally admitted, must postulate this as its indispensable base. If the hereditary patrimony is strictly immutable, then the idea that actual species come from different ancestral species cannot be accepted.

¹⁰Sec M. Grison, *Problèmes d'origine*, pp. 83-00.

²⁰"I do not pretend to have established that spontaneous generation never existed. In subjects of this kind one can not prove the negative. However, I claim to have demonstrated with rigor that all the experiments wherein there is supposed to have been evidence of spontaneous generation in the lowest forms of life, where the debate is now centered, are cases where the observer has been the victim of illusions or the cause of error which he has not seen or could not avoid" (translation of Pasteur's letter to Pouchet, *Œuvres*, Vol. II, p. 629.) — See René Vallery-Radot, *Life of Pasteur*, (Garden City Pbg. Co., 1924)- pp. 109-in.

B. The scientific question therefore remains open.

1. *As to spontaneous generation*, we must say that it has not been held since Pasteur, nor spontaneously realized in nature, nor realized by the ingenuity of experimentation.

Scientific effort has been brought to bear in two directions which could affect this problem :

a. Research has conducted investigations on the most rudimentary forms of life. The simplest forms among complete living things are the tiny bacteria called rickettsiae, which are of a size smaller than one-thousandth of a millimeter, and, among the parasites, bacteriophages and viruses which are in the neighborhood of a hundred-thousandth of a millimeter.

b. There has also been a great deal of research in the physico-chemical conditions which make elementary vitalization possible. These conditions are : (a) the formation of " organic " composites which in some cases lead us ultimately to chlorophyll, and in other cases to the amino acids; (b) the organization into cellular structure of the materials which are indispensable whether to a protein molecule (where the amino acids are a base), or to the initial functioning of vegetative life (where chlorophyll is required as a base).

In regard to the first point, the distance between living and non-living things has diminished to the point that we do not know how to classify crystallizable viruses.

In regard to the second point, we can conceive how the facts could have been connected by virtue of scientific hypotheses, but we have no way of getting back through paleontological evidence to the moment when life began on earth. On the other hand, we have not advanced the chemical process so far that we are able to fabricate a specific kind of protein, nor have we produced anything that would make us think of the structure of a cell.

Even the possibility of spontaneous generation remains scientifically doubtful. As to its probability, considering only the chance of mechanical encounters, we would say that it is

practically nil. " The unique law of chance consists simply in this : extremely improbable phenomena have never been produced or... have never been observed by any human being. " u Now, according to Guye, an organic type molecule — not yet organized — and even very simplified, has for its probability of becoming organized the figure 2×10^{-811} , and its fortuitous realization would demand 10^{32} billion years. Now the earth has been in existence only about two billion years and life around one billion years. " To write, as does Dauvillier : " It is only by the greatest chance that life began on earth, " " is simply to affirm this extraordinary improbability, and at the same time the actual appearance of life. Now, if this is meant to be an explanation, it certainly would be an outrageous absurdity.

2. *Xs to the transformation of species* through geneological descent, only one directly experimental fact approaches this : " mutation. "

Among the slight variants which characterize individuals of the same species, certain ones are not hereditary. They are " summations, " i.e., characteristics acquired in a general way, under the influence of environment. Others are capable of being transmitted. These are " mutations, " which have been studied especially by De Vries, and then by Morgan in his work on fruit flies. These variants concern the following details : color, hairiness, form and size of such and such organ. They seem to be produced spontaneously and suddenly by chance. Biologists have succeeded in increasing their frequency by submitting the reproductive cells to various agents (X-rays, radioactive elements, temperature, ruptures, and poisons such as colchicine). These mutations evidently indicate a slightly variable reproductive power in a living thing. They constitute, whether directly or by crossing of mutants, varieties, races and

⁷⁷ Trans, from *Le Jett, la Chance, le Hasard* of E. Borel, p. 98.

⁷⁸ Lecomte du Noüy, *Human Destiny*, pp. 26-37, 55-69.

⁸⁸ This quotation is a translation taken from Dauvillier's *Genèse, Nature et Évolution des Planètes*, pp. 340-341.

sub-species, but we have not observed any of them which has produced a truly new species. **

There has been no direct experience of an evolution which passes from one species to another. Then do we have the right to assert it, based on a projection of the evidence of mutation which we have? For the few biologists who think so, "the reasons are especially of a logical nature : since these mutations are the only variations known, they are necessarily those which differentiate the diverse specific unities." Could there not be variations which are unknown to us?

At any rate, even if we project the evidence beyond its immediate limits, we can base the transformation of species on another ground, that of geology. Paleontology actually shows that vegetative species and animal species appeared successively in an order of increasing differentiation. Now biology can explain the succession of living things only by generation. Therefore, it will admit, by reason of the paleontological facts, a modification of the specific patrimony in hereditary transmission, and it will affirm evolution beyond specific limits as a fact, whether one holds mutation responsible for this fact or not.

Thus science holds spontaneous generation of life as possible, but highly improbable. It holds mutation within a species as a fact, and evolution from one species to another as highly probable.

C. The philosophical problem here is essentially : Are spontaneous generation and a transforming evolution of species thinkable without violating rational principles?

An affirmative answer to this question seems to be indicated, since scientists, philosophers, as well as common sense, accepted these ideas as possible explanations up until the end of the 19th century. A contradiction is not so easily implanted in the human reason.

** See L. L. WOODRUFF, *Fundamentals of Biology*, pp. 474, 503-508, 589-598.

However, let us be more precise.

1. *Spontaneous generation.* A strictly spontaneous generation is absurd. To affirm it is to say that non-organized matter is a sufficient cause in itself of the differentiation in organic composites, and of their vitalization. It is to say that the cause is less than the effect. Such is, it seems, the contention of materialism, which thinks the play of chance in the mechanical movements of atoms is a sufficient explanation for the appearance of life.

However, the idea of spontaneous generation does not necessarily have this exclusive meaning. It can also refer to a possibility that there exists in being profound causes, by which, one day, non-living beings become living, without their vitalization depending on preexistent organic beings, but rather as an effect of cosmic causalities.

No argument has ever demonstrated the impossibility of these hypotheses.

a. It might be objected : A cause cannot be inferior to the effect, and therefore a cause of life cannot lack life itself. Undoubtedly, the adequate cause cannot be inferior to its effect, but a partial cause can be. Therefore, it is not permissible to conclude that the corporeal cause of a living being is living itself. We must say that the adequate cause of a living thing is living, whether it be a corporeal life, or one which is supra-corporeal. It suffices that God be living in order to explain corporeal life. Yet this does not suppress the role of bodies in the production of life. If we take a look at the mineral world, we see superior forms, those of composites, produced by inferior forms, those of simple elements, by reason of the physical influence of the cosmic environment.

b. One can further insist : Evidently God suffices to cause life, but then we would no longer be speaking of generation, but of creation. This is erroneous. If the physico-chemical causality of a body is used, if the preexistent matter is only transformed, we are speaking of generation and not creation, and this generation would have to be called experimentally spontaneous.

Tims there is no contradiction in the idea of spontaneous generation. We could even go further and say it is likely by reason of the metaphysical constitution of corporeal substances. Indeed :

1) Living things and non-living are made of the *same prime matter*, which is potency in relation to all corporeal forms, whether living or not.

2) *Souls*, with the exception of the rational soul, begin and cease to be in the same manner as do other *corporeal forms*. They are drawn from the potency of matter and return to it.

3) *Bodies* are *causes* of life as well as of existence, but only in an indirect way. They directly cause only the passage or the movement towards life or existence. They cause being only as auxiliaries of the First Cause. If their activity is always at the service of a Higher Activity, why prohibit them from serving in the production of life?

4) But is their *activity oriented* toward the production of life? This is the one question left. Now it can not be answered save by experience, since natural ends must be observed.

2. *Evolution of Species*. We can imagine the evolution of biological species from less differentiated species in two ways :

a. either we judge these original species the sufficient cause of the differentiation, even though they are less rich than the subsequent forms. This hypothesis is metaphysically unacceptable, because it makes an inferior perfection the sufficient reason for a superior effect.

b. or we judge that primitive species employ a matter disposed proximately to the acquisition of richer hereditary characteristics. We can admit that the factors of this acquisition can be found at the same time in the species themselves and in cosmic causes in general. Finally, we recognize that the orientation of these causes towards this particular efficaciousness is the work of a Providence, indicated at least under the characteristics of that enigmatic Anti-Chance of which Eddington speaks. This hypothesis is fully acceptable. It safeguards the rational principles linking cause and effect. But is it true?

Again, it is for the scientist to pose the question. Nature does not realize all thinkable hypotheses. Only experience can give the answer.

The *scientist* is far from having exhausted the study of the activity of bodies. He has scarcely peeked into the mechanism of generation. To be particular, what is the *necessity of fecundation*, when we can point out cases of asexual generation, e.g., by spores, and especially cases of parthenogenesis, where a non-fecundated ovum nevertheless develops? What is the *fixity of a species*, when we observe "mutations," which are hereditary modifications of a specific type, constituting races, varieties, and even "little species" within the big ones. Is there not in the living thing a latent orientation through the process of generation to find the new? We have artificially provoked mutations through physical agents, e.g., radioactive bodies. Do these agents do anything except manifest this orientation? Then "equivocal" generation could be a natural possibility.

Therefore, the question is not closed. When G. Bonnier wrote: "It is no more difficult to create an elephant than to create a tiny portion of living matter" (*Le Monde Végétal*, p. 384), he expressed a conviction, but he gave no proof. The scientist can conclude: There is not today any spontaneous generation nor evolution of species. There are only mutations, constituting sub-species. But no one can conclude from this either the absolute impossibility of spontaneous generation, or the simple certitude that it never existed, even in those epochs where cosmic conditions were considerably different from present conditions.

Let us, then, conclude. Actually, to our knowledge, no living thing comes into being without coming from a living organism of the same kind.

Let us take care, however, not to transform this fact into a metaphysical necessity, or label as absurd its negation, or esteem the research tending to verify the hypothesis of spontaneous generation as a dream.

Let us also take care not to treat the idea of evolution of species as irrational, and let us leave to the scientist full liberty to take this as an hypothesis for his work.

BOOK THREE

THE WORLD

We have studied the corporeal universe in its living and mineral elements. Now we will consider it as it is in itself.

The universe appears as a *whole*. We call it *the world*. It also appears as a *mobility*, prodigiously varied and ordered, which we call *nature*.

What are *the characteristics* of the world? What are those of nature?

What are *their causes*?

Eighth Question : What is *the corporeal world*?

Eighth Thesis : The corporeal world is

1. a tridimensional [*inite space*];
2. mutable, marked by *temporal* duration specified by evolution ;
3. *a universal* composite ;
4. relatively *perfect*, but contingent.

A. Notion. The idea of the world designates bodies taken in their totality. It supposes that bodies are linked by certain relations. Coexisting, they are localized in distances from one another. Simultaneous or successive, they are temporally situated at the same moment, or in anterior or posterior moments. By the intersecting of these relations, bodies form a natural unity, a universe, held together by a permanency which reveals a certain equilibrium, a certain perfection.

1. *The average man* knows something of this world because he must adapt himself to it. He enjoys it, and he suffers from it. He acknowledges that he is a part of it, but he is aware that he does not grasp it in its totality.

2. *The scientist*, through astronomy, one of the oldest sciences, today knows the stellar world with relatively great accuracy, because of powerful telescopes, spectroscopes, photography, electronic discoveries, and through the development of mechanics and mathematical inventiveness.¹ Nevertheless, for the moment, he has attained only that part of the universe which lies within approximately 2 billion light years of the earth.

a. *The universe*. The universe is made up of *galaxies*, which appear in the form of spiral² nebulae, similar to the Milky Way, of which our solar system is a part.³ One galaxy may number about one hundred billion stars, i.e., suns or solar systems. More than a million galaxies have been marked by present telescopes.⁴ A. S. Eddington calculates that the number of galaxies in the universe number around one hundred billion (*The Expanding Universe*, p. 4). Within the system of galaxies, they draw away from each other in proportion to their distances, with an average speed of 528 kilometers per second, times the Megaparsec of the distance (Megaparsec = 3.26 million light years).⁴ *The total mass* • of the universe is

* *Lumière et Vie* (Sept. 1954), pp. 9-20.

* Or elliptical.

■ A small number, around 3 per cent of the total, have an irregular form.

⁴ The telescope on Mt. Palomar can reach more than 600 million of them.

* The total volume of the universe is dilating like a giant soap bubble.

⁴ For certain astronomers (Hoyle, Bondi, Gold), the total mass of the universe would be modified in a way that the average density is kept constant. To compensate for the effect of rarefaction caused by expansion, there would be a continual appearing of matter ("creation") because of 500 atoms of hydrogen by Km* per year, which would result in around 50,000 stars per second. See G. Gamow, *Creation of the Universe* (New York: Viking, 1961), p. 32.

around 2.4×10^{56} grams, or about 10^{31} times the mass of the sun. Before expansion the *radius* of the universe was 1,068 million light years. The principal fact upon which this theory of an expanding universe is built is the spectral analysis of the light from spiral nebulae. When their rays move over to red, we have an indication that the source of light is drawing away relatively from the observer.' If this interpretation is true, the total volume of the universe is varying in a function of time. The universe must therefore be defined mathematically not as a space, but as *space-time*, the time determining the space. The German physicist, Einstein, has been led by this to modify the universal formula for gravity. He supposes, over and above the Newtonian force of attraction, a force of repulsion, proportionate to a "cosmic constant," which is relative to the distance between the masses, so that the greater the distance, the more repulsion prevails over attraction. This new formula allowed Professor Weyl to apply the same laws in gravitational and electro-magnetic fields throughout the universe, and also in the field of sub-atomic particles (A. S. Eddington, p. 28). The results confirm the theory of expansion upon which these laws are built.

b. *The stars.* Astral masses are *physically* different from each other. Their physical states range from extremely rarefied gases (1 atom of hydrogen to a liter) to a completely solid state. The first exists in the nebulous gases, and the latter in the moon. *Chemically*, the stars, through their light, do not reveal any elements which have not been discovered on earth. *Biologically*, certain solar planets seem to possess the environmental conditions required for organic life, such as water, warmth, light and atmosphere, e.g., Mars and Venus. It is likely that similar conditions can be found on other solar planets. It is possible that life could exist where these conditions exist. We could

' This is the Doppler-Fizeau effect which has been completely verified in relation to all bodies in the solar system. The relative withdrawing of a luminous source from an observer increases the period of emission, whereas the approach of this source diminishes the period. See *McGraw-Hill Encyclopedia of Science and Technology*, Vol. 4, pp. 264-265; also J. C. Duncan, *Astronomy* (New York : Harper, 1955), p. 167.

even suppose that intelligent beings inhabit these planets. Yet these are only hypotheses without any proof, such as the hypothesis of an even number of stars.⁸

c. *The history of the universe.* The universe has a history, a *cosmogony*. Eddington (p. 56), for example, imagines its origins in the following words: "...the primordial state of things which I picture is an even distribution of protons and electrons, extremely diffuse and filling all (spherical) space, remaining nearly balanced for an exceedingly long time until its inherent instability prevails.... There is no hurry for anything to begin to happen. But at last small irregular tendencies begin to accumulate and evolution gets under way. The first stage is the formation of condensations which ultimately become the galaxies; this, as we have seen, started off an expansion which then automatically increased in speed until it is now manifested to us in the recession of the spiral nebulae. As the matter drew closer together in the condensations, the various evolutionary processes followed — the evolution of stars, the evolution of the more complex elements, the evolution of planets and life." What was there before this state of equilibrium (the state of Einstein)? Eddington (p. 62) is inclined to think there was nothing, i.e., nothing thinkable in a scientific line. The Abbé Lemaître, however, offers an hypothesis — the primitive atom — which accounts for the state of Einstein. For perhaps 10 billion years, all the matter which today constitutes the universe was concentrated in one single atom, whose tremendous radioactivity caused it to explode. Its debris was scattered through space at tremendous speeds, and then progressively, the parts began to slow down to the point that we have the state of Einstein, which Eddington supposes as initial. One of the proofs upon which this theory leans is the existence of heavy radioactive atoms whose existence seemingly cannot be explained by the actual state of nature. Another is

• A plurality of inhabited worlds is quite unlikely. As for the planets. Mercury and Mars lack water, Venus lacks oxygen, while Jupiter, Saturn, Uranus and Neptune lack heat. If life exists on Mars, it is completely different from what we call life. See Harold S. Jones, *Life on Other Worlds* (New York : New Am. Lib.).

found in the existence of cosmic rays, which are witnesses to a far-off and mighty radioactivity. *

Such is the most comprehensive theory which has yet been formulated on the origin of the universe. It does not say from whence the primitive atom came. It does not say, because science knows nothing about it, for it can explain phenomena only by other phenomena.

The hypothesis of Laplace, which concerned a universe only in relation to the solar system, has been abandoned today. The only thing which remains is the fundamental idea, which sees a normal phenomenon in the formation of planets around a star. It has been replaced by that of Weizsäcker, who makes the planets originate out of contacts made in the vortices of matter. '•

Today it is no longer a question of the genesis of the solar system, but that of the galaxies which form the Universe.

3. *The philosopher cannot rest here.* The metaphysical method obliges him to affirm that the world has a total explanation, either in itself, or outside of itself. The characteristics of the corporeal world will show him that there is a certain insufficiency within the world to explain itself totally, and that it can only be explained by a Cause which goes beyond it. Let us study these characteristics.

B. The world is space.

1. *It is real space, i.e., an extension formed by all existing bodies, whether juxtaposed or distant, or a system of real relations of contiguity and distance.*

It is not absolute space, a merely possible space, i.e., extension in its pure essence, as is the extension of Euclidian geometry.||*•

» See G. Gamow, *Creation of the Universe*, pp. 25-29.

*• J. H. Jeans, *Universe Around Us*, 4th ed. (New York : Cambridge U. P. 1944). ch. 6, pp. 305-331.

*» This space is homogeneous, infinite, necessary and indifferent to the presence of bodies and their movement. It is constituted by the

The world realizes this "universal," as the totality of living men realize human nature. According to our astronomers, it realizes the notion of space in a variable manner, as the number of men varying from one epoch to another, realize the notion of man. It is *not*, "a fortiori," *imaginary space*, i.e., an immense receptacle in which bodies are lodged and within which they can move themselves about. "Kant has made this notion of space the basis of his critique. He does not recognize any other concept of space, and he identifies this space with mathematical space. However, he does not see in space a "thing-in-itself," but an "a priori" form of external sensibility. Popular language is on his side when it situates the world in such an imaginary space. For very many, creation is the introducing of a world into a preexisting empty space, which is ready to receive it. To speak of space in this reference is improper." We should rather speak of *place*, for it is place which is the container of bodies. Aristotle defined it as: "TERMINUS CONTINENTIS IMMOBILIS PRIMUS," i.e., "the innermost immobile boundary of that which immediately surrounds that body." 14

Ordinarily we are content to think of localization in an

notion of extension, unmixed with any other. In itself, it is the object of an idea, a work of reason (*ens rationis*).

However, it is an idea whose comprehension is grasped intuitively in sensible data, especially in visual and tactile data, and because of that, the idea has a real foundation (*ens rationis re fundatum*). Because of its meaning, it is realizable, but only as concretely differentiated and no longer homogeneous.

» This image is formed by the mind by projecting the movement of a body, or better still, of our body, indefinitely, as escaping the real world and moving about in an uninhabited space. This indefinite movement is imaginable only by virtue of the idea of space.

» To say that the world is localized in space is basically an attempt to put it in a place. This attempt is vain, since to localize is to determine the position of a body in relation to other bodies. To say that space is the totality of all places would be to suppose that it is the total place of the world. This is still erroneous, since real places must add up to a real total, whereas the space in which the world would be situated is only imagination.

• 14 See *Aristotle's Physics*, IV, 4, 212*-20. See also A. G. VAN MSLSEN. *Philosophy of Nature*, pp. 163-165.

imprecise way, e.g., I am living in Chicago. But there is a precise localization for each body at each moment, and science has been able to calculate it with a great deal of finesse, e.g., through its studies in luminous vibrations, cosmic rays, X-rays and the angular displacement of the stars. What then is the *precise* meaning of *place*?

Aristotle describes it as a kind of film without thickness enveloping the localized body, yet as being part of the bodies which touch it. In a word, this is the surface itself by which bodies touch the limit of other bodies. "Place" exactly circumscribes the localized body. Localization is thus a relation based on the contact between the surface of the localized body and the surface of the localizing bodies.

This enveloping surface is thought of as immobile, because it is in relation to it, as a point of reference, that movement is appreciated. It is also thought of as immutable, or as abstract in relation to the bodies which really furnish it. Bodies change nature, are displaced; but it makes no difference, since they are replaced by others which offer, or can offer, exactly the same enveloping surface. Thus it is a touching surface which alone constitutes place or local point of reference.

Aristotle wished to go further. He sought to localize the localizing bodies. Degree by degree he arrived at a general localizer, the "first heaven," enveloping the rest of the world, within which all the parts were situated. Under this form he affirmed an absolute system of real movements.

Contemporary science has a different conception of place. It localizes in relation to a three-sided point of reference, constituted by three planes, two of which are perpendicular to each other. Each point of space is localized by its distance in these three planes.

The apex of this three-sided point of reference may be situated at the center of the earth, or of the sun, or of the atom. Does this mean that science rejects an absolute localizer and denies its existence? No. One can, for example, find such an absolute localizer in the center of the primitive atom of Lemaître.

In comparing the two notions of place, we can see that they are not opposed to each other. That of Aristotle is more concrete and qualitative, whereas that of the scientist is very abstract, much more simple and more useful for measuring. The first is richer in reality, and what the second loses in immediate reality, it gains in precision. Thus, when science reduces a localized body to a single point, which confounds localization with its center of gravity, and movement to a linear trajectory without height or breadth, there is only a seeming inferiority in the scientist's notion of place, because he can still come back and consider the volume and external form of the displaced body. This he actually does, for example, in the studies on wind resistance to airplane and automobile bodies. The scientist then becomes Aristotelian — without knowing it — by returning to a notion of concrete place.

place, taken in itself, is, in both conceptions, an "cns rationis," but it expresses real relations, which really modify the interaction of bodies.

Now, *ts the world in space*, or more exactly, is it in a place? To understand the question is to have the answer. The world is the totality of bodies, and is therefore not something contained in a body which envelops it. The world is not here, nor there, nor anywhere. Imagination will protest : space is linked to the conditions of sensation even though it be constructed with a view to the idea. To uphold the idea of a possible absolute space, it has no other choice than to construct a space which is independent of the world and greater than it. It places the world in this space, but it is a completely imaginary localization without any reality.

We must say the same thing of the question : *Does the ivorld move from otic place to another?* How can that which is not anywhere move from one place to another? The idea of general expansion is completely otherwise; here we are dealing with real distances, those between the galaxies, which are increasing.

The world *is* real space. It *is not in* space.

2. It is a space in three dimensions, i.e., involving three dimensions or extensive measures, which vary independently : length, breadth and depth.

This truth was not challenged before the 19th century. Then, different "metageometries" were constructed, supposing "space" to have more or less than three dimensions. Classic geometry had rested on the Euclidian postulates. *Lobalchewsky*, seeking to demonstrate the absurdity of other than the classical postulates (1829), found that one could, on the contrary, draw' from a contradictory postulate, such as the possibility of an infinity of parallels, an infinity of theorems of which none would contradict the initial postulate. Thus he constructed a geometry in only two dimensions. *Riemann* did the same beginning with the postulate that one could not draw a line parallel to any given straight line. Thus were constituted the pure geometries, having n dimensions.

The 20th century saw these geometries become the instruments of physical theory and astronomy. Einstein affirms the relativity of time and space. Minkowski imagines, in order to represent the relations between them, a space-time, i.e., a continuum having four dimensions. This space-time is the world for the contemporary scientist, a space having four dimensions, time being the fourth.

The terms which these geometries use, space, dimension, line, do not have exactly the same sense which Euclid gave to them. They have a wider sense. The extension of meaning began with the symbolic expression of geometric dimensions in the language of algebraic functions. Thus a polynome to the second power, $ax^2 - bx + c = 0$, is represented by a parabolic curve. Now, this polynome can also express the law of uniformly varied movement and thus translate an aspect of the physical world, such as the fall of a projectile. Space and its three dimensions still signify measures which are properly *extensive*, but now they also symbolize a *temporal* measure which is linked to space (movement), but which no longer means coexistence of parts outside of parts which is extension. Thus, *space* designates a system formed of four measures, independently

variable of one another. They are called "dimensions" or "perpendiculars" to one another, to show that each can vary without a variation in the others. Why limit a system to four dimensions? In pure mathematics, there is no reason to do so. One can group together as many different dimensions as one wants to. In physics, can we be sure that all real measures are reducible to the three dimensions of extension? Is there not, at least, an advantage in symbolizing as so many distinct variables (dimensions) those characteristics, which — in the present state of science — are shown to be irreducible? Could this not be done in regard to volume (and its three dimensions), time, mass, electric charge, etc? There are those who have said that real space has more than three dimensions.¹⁸ However, this does not contradict the statement that space has only three dimensions, because the word "dimensions" does not have the same sense in the context of this discussion.

A little attention will be sufficient for us to dispel the equivocation. The term "dimension" no longer designates the extension of simultaneously existing parts, but in general any continuous measurable. Thus the scientist who speaks of four dimensions does not contradict the philosopher who admits only three. The scientist wishes to point out that time is a variable upon which the three others depend. Yet he admits: "Although the variables of space can vary indifferently in one direction or another, time flows on always in the same direction." (L. de Broglie, *Revue de Métaphysique et de Morale*, 1933, p. 271). In other words, it is not an extended measurable, nor a dimension in the proper sense of the word.

(a) *Space can not have less than three dimensions.* Actually a line and a surface are real only as limits to volume. There are no real dimensions unless there are three, (b) *Space cannot have more than three dimensions*, because all the possibilities of

* See E. Whittaker, *Space and Spirit* (London and New York: T. Nelson, 1946). p. 104, "A system of physics has been proposed by the late Sir Arthur Eddington in which (time-space principles are relegated to a lower level) this principle is carried out by introducing sixteen symbolic coefficients which express the dimensions of the universe."

dividing extension and of measuring it as it is extended are defined by three lines perpendicular among themselves (system of reference). Therefore, there is no measurable which varies spatially which is independent of three dimensions. As to the postulate of Euclid, one can deny it, but only on the condition of abstracting from the extensional character of variables. So the postulate remains indubitably true if we apply it to extended variables in the Euclidian sense, i.e., as they are extended. Real space is therefore an extension in three dimensions.

3. The world is a *finite space*. Modern science admits this and an easy analysis proves it. This is not a case of possible space, which is "infinite" in the sense that every abstract notion is indifferent to number. Nor is it a case of imaginary space, which is "infinite" in the sense that the imagination creates it at will, beyond any assigned limit, and can prolong all kinds of movements indefinitely. We are treating here of real space, and that is finite. This results from these three propositions: (1) The extension of each body is finite. (2) The actual multitude of bodies is finite. (3) The distances between bodies are also finite.

The first proposition is demonstrated in the first thesis. Furthermore, the individuality of each body demands that it have its proper limits.

The second proposition is a metaphysical necessity. An actually given multitude is composed of a total of units characterized by the simultaneity of their existence. It is impossible that a total of units form anything other than a number, and every number, being a measure, is finite.

The *third* proposition is drawn from the existence of local movement. An infinite distance could not actually be covered,

M See *Summa Theol.*, I^o pars, q. 7. a. 4. St. Thomas asserts that an infinite multitude is possible in potency. Such are the parts of the continuous, but he further asserts that such an infinite multitude of parts in act is impossible. Actually, he says that a multitude in act is of a determined kind. Now the determination of a multitude is a number, and when we speak of number, we speak of measure and limit.

but distances between bodies are covered, at least by light. They are, therefore, finite. n

It does not follow that the dimensions of the universe are unchangeable. Astronomy asserts that space is at the same time finite, and that its dimensions vary every moment. Increase belongs only to the finite.

Consequently : a. The world is not infinite in the way that geometrical space is, nor is it the filled space of *Descartes*, nor the empty space of *Gassendi*, nor is it identified with the immensity of God, as *Kenton* thought.¹⁷

b. The world is not simply an idea. Kant was mistaken in drawing this conclusion from the third antinomy, as he was mistaken when he made space an "a priori" intuition (First Thesis, p. 11).

C. The world is changing.

1. This is so :

a. *In its parts*. Actually every body is subject to local movement, qualitative alteration and substantial change. Each body encloses within its essence a principle of most profound change. Each body exists between two relative nothings, wherein its matter alone persists. The heavenly bodies themselves actually lack that "incorruptibility," which the constancy of the stars suggested to Aristotle and the Scholastics. They are formed of the same elements as the earth.¹⁸

¹⁷ Is it possible that a nebula and the earth would draw apart from each other with a speed greater than light? If this were possible, it would seem that we could conclude that the world would no longer be finite, since there would be an insurmountable distance between two of its components. Response : If this were possible, the nebula in question would no longer be a part of *our* world and our world would remain finite. Science says this when it poses the admissible limit of speed in physics as the speed of light.

*See J. A. McWilliams, *Cosmology* (New York : Macmillan, 1928), ch. X. pp. 90-103.

*The spectroscope has put an end to the illusion of the ancients. It has even led to the discovery of elements in the stars, which were not discovered in the earth until later, e.g., helium, which was first perceived in the sun.

b. *As a whole*, the world is changing. If it is true that its volume is expanding, it is changing in its *extension*. It is certainly doing so in its *qualitative state*, because (1) *energy* is diminishing, transforming itself more and more into heat and tending to spread itself uniformly in all bodies. (2) *Life* began in the world, and it has changed through the course of the ages by putting on varied forms, and by incorporating itself into a host of various individuals, and even perhaps, by migrating from one planet to another.²⁰ It will continue to change, and will one day cease to exist on earth. (3) The movements of *stars* have required and will require variations. Their physical and chemical state is in perpetual evolution. Perhaps cosmic rays have their origin in the formation of heavy radioactive atoms by means of condensation in the nebulae. In any case, the inverse phenomenon, atomic disintegration, is a universal fact.

2. Because it is changing, the world is *temporal*. Time is its proper form of duration.

a. *Different durations*. To have duration is to continue to be, to exist after having existed. We can conceive three modes of duration. The first would be that which changes in no way, which keeps its existence in an absolute identity. This would be *eternity*, which Boethius defines as "interminabilis vitae tota simul et perfecta possessio," and which natural theology shows us to be the duration proper to God. The second would be to keep a substantial existence, changed through successive enrichments, which are all qualitative and discontinuous. This is "aevum" or *aeviternity*, which, for the Scholastics, characterizes pure spirit. The third consists in changing in a continuous way, while remaining in duration. This is *time*.

b. *The world-time*. It is evident that the duration of the world is temporal, because all the bodies which make it up are

** A very unlikely hypothesis : beyond the layer of ozone in the heights of the atmosphere, solar ultraviolet rays are the merciless executioners of all that lives.

locally mobile, and local movement is essentially continuous (see p. 47). In its duration, the world is a system of movements from those of electrons to those of the galaxies, which unfold simultaneously and successively, and which make up a very complex history. The world is real time, but it is not possible or absolute time, which is an abstract and mathematical notion, applicable "indefinitely" to all times, and no more expressive of this world than any other. » Neither is it *imaginary time*, the representation of an empty flowing, which was filled with events when the world began to be, and which will continue to cut out a dry bed, even when the flood of events has ceased to run there. Real time is no more than an ensemble of the durations of all corporeal movements, a concrete and partial realization of abstract time.

c. *The nature of time.*

1) Its abstract *nature* was defined by Aristotle as "NUMERUS MOTUS SECUNDUM PRIUS ET POSTERIUS" (*Arithmos kinêseos kata to proteron kai ùsteron*, Physics, Bk. 4, 11), i.e., the measure (the determined dimension) which movement possesses, insofar as it is successive.

Time is actually inseparable from *movement*. In order to perceive time, one must perceive change. Yet it is not movement itself, for it is common to all movements, and it is neither rapid nor slow as all movement is. It is, therefore, only a property of movement. Time supposes the *succession* and continuity of movement, and it expresses the parts of it in a relationship of before and after, disregarding movement under its aspect

* Ixit us here think of a time which refers neither to the stars, nor to clocks, of a time which we use, for example, in studying the positions of a mobile under the influence of a uniformly varied movement (ax 4- bx 4- c - o), or the propagation of a periodic movement ($V = N$). This time is only a continuous, infinite and homogeneous flowing, because, through abstraction, it is stripped of every characteristic which is foreign to itself. It is because of this that it is mentally applicable to all kinds of movement. However, its real application demands that we select a real movement, which will act as a gauge to the other movements: apparent movements of the sun, of the moon, the flowing of sand, the vibration of a tuning fork, and today even the vibration of a particular atom.

of qualitative and quantitative diversity, whence its aptitude to designate any movement, and even the duration of the immobile and identical." Finally, time is short or it is long. It is a *determined dimension* and it is numerable. It is succession insofar as it is measurable. In this it is real, "because succession is measurable. Actually the movement in which it is realized has a beginning and an end. Again, between these limits, the succession is continuous and therefore divisible, by reason of the continuity of local movement. Thus real time is the proper dimension of continuous succession. It is its number, its measure.

Objection. Bergson denies that real time is a dimension. This is true only of mathematical time, which is only a form of space and homogeneous like it. Bergson insists that real duration is purely qualitative and heterogeneous, and that it is our imagination which transposes this qualitative heterogeneity into a quantitative symbol, a line, within which we tie events end to end. (*Essai sur les Données Imm. de la Conse.*, pp. 74-90).

Evaluation. a) Bergson is right to distinguish two kinds of time. There is an abstract time and a concrete time, time thought and time lived, the time of local movement, and the time of qualitative change, especially the time of the facts of

"How can the duration of an immobile be designated by time? That depends. The Absolute Immobile, God, simply cannot be designated by time, even though we may express His duration in terms of our own. To say that He was yesterday and will be tomorrow is not at all to know divine duration, for time is foreign to God's essence. An immobile, which is designated by time, is necessarily and exclusively corporeal being, which, although in repose, can be displaced or changed in a continuous way. To measure its repose is to measure the displacements which are really possible to it.

"Time, taken in itself, or as an effective measure of movement, is the work of the mind, an *"ens rationis."* It is, therefore, either an abstraction *"ut sic"* (taken as it is in itself), or a numbering, which is an operation of the mind adding up parts which never exist as a whole in nature. In this sense, time is in the soul. It is thus, that St. Augustine and St. Thomas, in line with Aristotle, think of it. *"Si non esset anima, non esset tempus"* (Physics, II, I, 17). However, time is real, as a dimension of movement which is linked to its successive continuity. *"Numerus"* therefore means "a numbered number," i.e., a measurable dimension.

consciousness, the awareness of one's self and the objects of memory.

b) But *why deny all mutual relationship* in differing concrete durations? Why reject the abstract homogeneity which the mathematical idea of time supposes in them? All changes are similar to one another by their succession, wherein one determination leads to another. Local change, in its relation to extension, possesses continuity in its succession, and communicates it to the qualitative motions which always involve local movement in a corporeal change. Thus, every corporeal change involves continuous succession, a successive dimension. Abstraction only takes notice of this homogeneity, it does not create it. Certainly real duration is qualitative, as is all movement, but it is also a dimension, and this allows mathematical physics, in speaking of duration, the right to speak of it in purely quantitative terms.

c) Moreover, Bergson has linked the duration of material things too closely to psychological duration. Granted that he has done an excellent job in pointing up what science forgets — the individual character of duration in the animal, plant and molecule. Let us grant that we compare the duration of things with duration as experienced in human consciousness. Nevertheless, when one describes duration in exclusively psychological terms, is he not as guilty of an inverse confusion as those who seek to give time only a mathematical sense? Actually, psychological duration, by reason of memory, implies in the present act of consciousness the survival of the past as well as the anticipated life of the future. Moreover, changes in the intellectual, artistic and especially the moral life, bring up a duration other than time, because these changes are immaterial, instantaneous in themselves, and are acquired forever. In human duration, the “aevitemity” of a spiritual being is mingled with the time of a corporeal being.

2) How can we *concretely* characterize the world-time, real time?

a) With what are we concerned? The world-time is the successive dimension of events which have led to the existence

of actual events and of future events which will result from these. Its present is not isolated from its past. As a limit of the past it is always moving forward. Without a doubt, only the sliding by of this ungraspable moment is the object of experience, but it is not the whole reality of time. The greatest riches of time are its past and its future, each real in a differing fashion. One is the root of the present, the other its fruit. Each moment is the seed of the following.

b) Is it a cycle of events which are repeated indefinitely?

The revolutions of the moon, of the sun, of the stars, the periodical return of the seasons, the rhythm of human generations, the alternation between the rise and fall of nations, as well as of individuals, have always inclined man to think so. Even the form of human thought adds a pressing invitation to this. Can not the universal idea be realized a second and a third time, just as well as the first time? That which is done one time, does it become impossible to do again?

Actually all Greek philosophy is penetrated with the idea of a return of the world to positions which were occupied before. Plato's myths of immortality are only the application of this general view of the world to man. Immortality is principally the reincarnation of metempsychosis. The Stoics held that the world came about through the development of a seed, a "seminal source," which furnishes the individual seminal sources of each living thing. Through certain processes of development the cosmos arrives at a degree of perfection. However, this perfection is shattered in the production of new seed, which, after a general conflagration destroying the old world, will become the source of the development of a new world. Thus the cosmic cycle imprisons time.²⁴

Actually, up until the 19th century, philosophy retained much the same vision of the world. However, the Judaeo-Christian revelation showed a world in constant growth towards an eventual spiritual flowering. Fallen man, now redeemed.

²⁴ See F. M. Cornford, *Plato's Cosmology*, translation of *Timaeus* with commentary (New York : Bobbs-Mcrrill, 1957), p. 103.

must mount towards God, taking with him the world, his kingdom. The history of the Redemption appears irreversible, and the real time of the world, its real duration, appears as a becoming, a marching forward without return to an eternal perfection (or an irreparable ruin). If these dogmas transformed man's time for the philosophers, yet they did not modify the philosopher's conception of the world's time. The fulfillment of the temporal destiny of the world (the "end of the world") remained an object to be contemplated by faith.

It is through science that man has actually come to the idea of a real and irreversible time for the world itself.

c) Evolution of species is concretely, for contemporary science, the notion of a world-time. Cosmic history, as a whole, appears as the gradual acquisition of structures and interactions which become more and more differentiated, and more and more varied. "

1st Stage <i>From one to many.</i>	One single initial atom (Lemaître's theory) produces, by successive explosions, that which remains with us as radioactive bodies, a fantastic amount of elemental particles, which constitute, at a given moment, the universe of Einstein.
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2nd Stage <i>From chaos to stars.</i>	Condensations set in, which become nebulae, then stars, then planetary systems, young and hot stars and planets, then adult, then cold.
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3rd Stage <i>From particles to molecules,</i>	Some particles combine into light atoms, light atoms into heavier atoms (H into He, for example); the atoms combine into molecules, beginning with the lightest and forming heavier and heavier ones until they approach those giant molecules necessary for life.
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" See Harold S. Jones, *Worlds Without End* (London: Hodder & Stoughton, 1938); A. AnceI, *Métaphysique Générale*, pp. 685-686; M. Grison, *Témoignage de l'Univers*, pp. 55-110.

4th Stage One day, bacterial life and green life begin
brom molecules from very heavy molecules (with a base of
to bacteria. carbon and nitrogen), formed under exceptional
cosmic conditions, which, undoubtedly, will
never be found again on the earth or elsewhere.

5th Stage A multitude of steps constitute this stage,
From bacteria attested to by geology. First of all the
to the vegetative chlorophyllian thallophytes (algae), then the
kingdom. archaic mosses, then the ferns, then the
gymnospermae and the cone-bearers, and finally
the angiospermae.

6th Stage It begins after the opening of the 5th stage
From bacteria and exists together with it. Its beginnings
to the animal have left no evidence in the geological layers :
kingdom. Protozoa, sponges and medusae. Trilobites
are quite visible in the Silurian layer. Then
begin the fishes, first the cartilaginous and then the bony. Then
came the amphibians, followed by reptiles, then mammals,
and finally birds.

7th Stage Only in the Quaternary period does man
Man. appear.²⁰

All of these stages are not known with the same certitude. The last three are inscribed in an undeniable way in the geological layers of the earth. The preceding four are an hypothetical order of events, based on actual astronomical observations and on the study of the terrestrial globe. This latter reveals that life has not always existed on earth, that it began after a purely mineral period, under conditions making the implantation of life possible. Thus we have the foundation for the 4th stage. The first three are only the result of an interpretation of phenomena observed in the sun (cycle of Bèthe), in the novae and nebulae. The information read by the astronomers of today concerns facts whose spatial origin is hundreds of millions of years old.

^{**} Sec Lecomte de Noüy, *Human Destiny*, ch. 5, 6, 7 and 8.

These stages are not exclusively successive. They are successive, inasmuch as each stage began after another, but certain ones often coexist with one another. Thus vegetative and animal evolution have gone on together during the greatest part of geological time.

Mark well that the evolution of specifically different things is a simple description of the becoming of the world, of its real time. It is not in the least degree a causal explanation of the world, and it is quite another thing than evolution by descent. *It only dates* the appearance of diverse biological forms and those of stellar and atomic structures.

The *remarkable trait* which characterizes the time of the world is that it is a movement from a less differentiated state to a more differentiated one, an *evolution of species*.²⁷

To sum up, science finds again, but in its manner, i.e., without any reference to a First Cause, God, the description of the first chapter of Genesis, and what St. Thomas calls "the differentiating of things" (*Summa Th.*, I, 47; "De Distinctione Rerum"). While science thinks of this differentiation as being done over the course of history, St. Thomas thinks of it in terms of the Bible, and describes it as realized in its original causes. Science's view is centered on man and his time, and is not interested in the world except as it is related to man.

In both cases, the specification of things does not disrupt their unity. Bodies constitute *a universe*, despite their many varying stages and degrees.

D. The world is a universe, i.e., a natural unity.

1. This *unity* is that of relations among all bodies. These relations exist. The extension of *loci* localizes them in relations of *contiguity* and *distance*. Their mutability involves them in a kind of cosmic dance, where they *succeed* each other in the same places, or in new existences. Their activity and

²⁷ We do not wish to deny that there exists another aspect of time; uniformity and regression. See question 9. See also Julian Huxley, *Evolution. the Modern Synthesis* (New York: Harper, 1942), p. 42.

their passivity create among them relations of *causality* and *of utility*, which in a word may be called *dependence*. Thus all things are drawn to each other and all things are repelled. General influences serve particular bodies (heat in chemical combinations, for example, light in growth of plants); certain bodies serve others (as the mineral serves the vegetative, and the vegetative the animal and vice versa). There is in all bodies a sort of blind aspiration to the good of the whole, which makes the world a kind of "society," a whole whose parts are interdependent, a universe. Its unity is *not simply a mental view point*. Neither the scientist nor the philosopher has created it. They have discovered it. Therefore, the unity of the universe is real.

2. It is, however, the unity of a *composite*. Many have seen the unity of the universe so well, that they have lost sight of those equally evident signs of its substantial multiplicity. It is, thus, that the universe forms *only one substance, for* :

a. The Hylozoists : its movement, its order, demand a soul, intellectual, according to the Platonists, and divine, according to the Stoics.

b. The Pantheists : the world is the manifestation of two divine attributes, thought and extension, whose multiple souls and bodies are only so many modes of one existence, as Spinoza thought.

c. The evolutionary Monists : matter is the unique reality evolving from inorganic to organic and differentiating itself more and more, as Haeckel thought.

These *absolute forms* which would gather man into this substantial unity are, at first sight, false. Consciousness will always proclaim its individuality, and morality will never be satisfied with an annihilation of personality. Men are substances distinct from the rest of the universe. Even if we *limit* these theories to inferior living things and to minerals, because they are not contradictory at this level, we must say that they are, at most, theories which are seemingly opposed to our experience of the world. The study of substantial change has led us to

uphold the plurality of individual substances. The universe is therefore composed of distinct substances, and its *unity* is *only accidental*. We must search for the cause of this order elsewhere than in a world soul, and find it in a provident and directive Intelligence.

scholium. Are there not *many universes*!

1) To speak of distinct universes is to suppose that there are corporeal ensembles having no relation or influence on one another, with neither mutual attraction nor repulsion, from which no light is transmitted.

To pose this question is to point up our ignorance. If such universes existed outside our own, our experience and our science would not be able to attain them even by hypothesis, for we can not grasp the existence of anything, unless we receive some influence from it, which would have to be at least indirect. However, this is no proof that such universes do not exist. To prove this we would have to demonstrate that all which is, is knowable by man and has man for its center, and this seems like trying to prove from blindness that light does not exist.

2) However, we can say, in quite a different sense, that there is only one universe, i.e., one uniquely realized plan. Natural theology will offer us the opportunity to demonstrate that everything which exists has for its cause, one Creator, who is perfectly intelligent and wise (*S. Th.*, Ia pars, q. 47, a. 3).

E. The perfection of the world is very great, but not the greatest possible.

1. This is a question which has been debated since the beginnings of philosophical thought under the form of the question : " Is the world good or evil? " The religio-philosophical systems of the Chinese and the Hindus understood it in an *anthropocentric* and moral way : What is the world worth to man? What conduct in it will be the best for man? The same questions were the concern of the German pessimists Schopenhauer and Hartmann. These questions have their importance, but they bring up moral philosophy. Thus, they can be clarified

only by the study of the nature of man and his link with the world, by the study of God, the Author of man and the universe, as well as by the study of the world in its proper perfection.

The latter is properly our *cosmological* question. To be perfect can not mean here usefulness for man, nor usefulness in any sense at all. The value of the useful is deferred to the question of the value of an end. Now, the final and only decisive end of the world cannot yet be determined.

a. To be perfect is simply to be. The measure of perfection is the degree of being. The perfection is greater in the degree that there is more existing quantity and quality. Thus the multiplicity of species, of individuals, the harmony in diversity, and the intensity of qualities are marks of perfection. Now, the universe harbors a fantastic number of distinct individuals and kinds. It realizes them in a process of constant renewal, in the circular movement of stars, and in substantial generations. Its actual riches are only momentary, heir of the prodigious developments of past ages and generator of an unfathomable future.

b. The richest aspect of the perfection of the universe is found in the order of finality which unifies its vast domains. This order adds to the reality of individuals and elementary groups the reality of a common good, produced, maintained and utilized by them. Many of these mechanisms have a finality which has been observed, and they have been shown to preserve each other by reciprocal action.¹⁸

Thus life can exist only if it is protected against ultra-violet rays of at least 2,600 Å° by ozone. Now oxygen, O₂, is transformed into ozone, O₃, by the action of U. V. rays; thus the more active the U. V. rays are, the more O₃ they form. The protective cover of life is therefore constructed by the very influences which tend to destroy it.

The same is true in the balanced production of CO₂ and O₂, the former being indispensable to vegetative life, and the latter

¹⁸ See Dr. E. H u a n t, *Biologie et Cybernétique*, Cahiers Laënnec, ch. 2.

necessary for all life; thus a balance between respiration and chlorophyllian assimilation assures the maintenance of life.

Again, a necessary equilibrium is realized between autotrophes (fabricating alimentation) and heterotrophes (users of prefabricated alimentation).

c. Another aspect of the perfection of the universe is seen in the extraordinary development of the sciences of the universe. That which science attains is the being, the intelligibility, the perfection of the universe. Now, despite the many centuries of study, and despite so many happy discoveries, the universe still goes beyond the reach of experimental science. The true scientist knows that the universe is infinitely richer than what he knows of it. "The universe, with its astonishingly vast and profound organization," led Hamelin to conclude that "only God could carry" this prodigious burden.^{3#}

We can conclude that the universe taken in itself is very perfect. Some aspects of its perfection are the immense multiplicity of its individuals and kinds, the seeming conspiracy of its living creatures to establish an equilibrium favorable to all life, and the unfathomable depths of intelligibility which it offers to the human mind.

Must we then say that this perfection is absolute?

Absolute optimism is actually a temptation. This was the position of Plato, the Stoics and the Neo-Platonists, for whom the faults of the universe were only appearances. In the 17th century, this was the position of Spinoza, Malbranche and especially Leibniz, its most complete representative. Among them all, the basic reason of their optimism lies with the Divine Causality which produces the world. According to Leibniz, the only sufficient reason that God could have had for creating this world is that this world is the best possible world. From this we must conclude that the apparent imperfections of the world serve its total perfection, as shadows serve the beauty of a painting.

** O. Hamelin, *Essai sur les Eléments Principaux de la Représentation*, P- 494-

The optimism of St. Thomas (*S. Th.*, Ia pars, q. 25, a. 6) is not absolute. God could not have been more perfect in the realization of His work, but the world could have been more perfect, because the perfection of the universe is limited, and therefore something which can always be increased. The world could be richer, actually, if its extension were doubled or tripled, if its present still contained the riches of its past, e.g., extinct living species, or if it contained now what it will have. As long as we suppose it spatial and distinct from God, no universe can be the best possible, for, being finite, it must necessarily lack some perfections. Our universe, which is spatial and temporal, is tremendously perfect, but it is not the most perfect possible.³⁰

2. It is also *contingent*, and this is its most intimate imperfection, which marks it in the very heart of its being.

a. That which is not able not to be, is said to be necessary, while that which is able not to be, is said to be contingent.

That which is able not to be is understood in two senses :

(1) in a *metaphysical* sense : that which does not have existence of itself, and, therefore, can, without contradiction, be thought of as non-existent; (2) in an *experimental* sense : that which having come into existence can also pass out of existence. " *Quod possibile est esse et non esse* " according to the words of St. Thomas (*S. Th.*, Ia pars, q. 2, a. 3). The clearest sign of contingency is the absence of existence which preceded or which can follow a given existence.

Nevertheless, there is a sense in which the perfection of the universe is absolute and unsurpassable, but it is by virtue of a purely supernatural gift through which it becomes God's partner. It is man who is actually called by the divine liberality to this Absolute End, which is the Vision of the essence of God. This is made possible through the unsurpassable perfection of the Incarnate Word who is our Redeemer. Through man, the material universe participates in this elevation.

This was also the perspective of Leibniz, but he did not separate it from abstract principle. God, who is all wise, can choose only the best. This too strict union between Wisdom and the best evidently destroys the supernatural character of the perfection of the world, and at least compromises the free nature of divine choice.

Now, every corporeal individual is contingent, for it carries within it the *-principle of its destruction, prime matter*. Therefore, the universe as a whole is also contingent. In order to contest this conclusion, one would have to prove that the universe possesses a richer substantial reality than that of the bodies which constitute it. Now, the universe adds to bodies only accidental relations. It is the result of multiple individual existences, and its existence depends on theirs. It is "a fortiori" contingent, since they are.

It can be objected: that prime matter is not contingent, for it cannot cease to be in substantial change. Common to all bodies, it is the veritable stuff of the universe, which is no more contingent than prime matter is, for they both subsist through all changes. Let us point out first of all that the universe subsists no more than prime matter does. Now prime matter cannot exist through itself. It is, because of the existence of the composite of which it is a part. It is that which is the most contingent and the very root of contingency in the individual. In its concrete reality, it changes existence in every substantial change. It is that which, unceasingly, can be what it is not, and no longer be what it is. Its whole "necessity" is reduced to its need of a form and its aptitude to lose it. This necessary property is completely opposed to the necessity of existence which excludes all need and all non-realized possibility.

b. There are other signs of contingency as well. *The finite* is contingent, and the same is true of *the changing, the composed, the relative*. The necessary in existence is of itself Infinite, Unchangeable, Simple and Absolute, as natural theology will demonstrate when it treats of the attributes of God. Now the world is finite, changing, composed and relative. Therefore, it is contingent; it is, and yet it is able not to be.

Consequences. 1) every contingent being is a caused being. *The world, therefore, has a cause distinct from it.* The contingent does not have of itself the sufficiency to exist.. It exists only because there is a cause which gives it existence.

2) The universe, not being the adequate cause of its own existence, can much less be the cause of the existence of the corporeal beings which begin within it. The problem posed by substantial change is now amplified. A gnat is born : the entire universe does not suffice to engender it. *There is an ultra-cosmic Cause* in action. What is the nature of its causality?

Ninth Question : What is the cause of the corporeal world?

Ninth Thesis : 1. The efficient cause of the corporeal world is *creative*.

2. Whether the world was created *from eternity* or *in time* can not be known by reason.

A. The creation of the corporeal world is a rational truth, even though it did not come into the history of philosophical thought independently of Judaeo-Christian revelation (cf. Etienne Gilson, *The Spirit of Medieval Philosophy*). Aristotle did not deny creation, nor does his theory of eternal matter implicitly deny it. He is simply unaware of it.

1. *Notion*, a. *Origin*. Experience offers no example of creation. Experience testifies to beginnings that are always relative, never absolute. Everything which is made before my eyes is made from something which preexists. Everything which begins is the term of a previous becoming. It is a new arrangement of something that was around before. At the level of experience from which it draws its positive content, the verb "create" designates an activity which produces something new, seemingly much more independent of the old, and having a richer fecundity, e.g., the creation of a work of art, procreation.

b. *Negative sense*. Catholic theology has taken this word to designate an action which produces something with no dependence on preexistent materials. This is clearly indicated

in the formula "creare ex nihilo," "create from nothing, i.e., to produce without using materials. Now every ordinary production is a transformation which begins with a positive term, *a quo*, *ex quo*, but creation has no positive starting point, as is clearly indicated in the formula : *creare est producere substantiam ex nihilo sui* (in this it is similar to every action) *et subjecti* « (this is proper to it).

c. *Positive sense.* Hence, what creation produces is not the union of a particular form and an existent matter, not a becoming, but the very being in all that it is. Thus we have these traditional definitions : "productio rei secundum totam substantiam"; "productio entis in quantum ens"; "productio totalis rei." The notion of creation, therefore, does not of itself imply any relationship to time or change. Defined by an immediate relation to existence, creation coexists with the created being.

2. *Proofs, a. By exclusion.* Three general hypotheses can be invoked as explanatory of the world : (1) the world is not caused; (2) it is caused, but is not distinguished from its cause, for it is an emanation or evolution which remains the same nature as its source; (3) it is caused and is distinct from its cause. It is totally produced, and therefore a creation.

The *first* hypothesis is false, because it can be substantiated only by one or the other of the following reasons. Either the world is necessary, despite the signs of contingency it shows, or it is contingent (that is, able not to be), but is still the sufficient reason for its own existence.

Is it possible that the universe is not contingent? No. To deny its contingency would be equivalent to denying the

« "Ex" actually indicates the matter, the materials from which a thing is made. However, we must be careful not to give it the sense of a chronological or causal origin, "beginning with" or "an effect of an absolute nothing." In this sense, from nothing, nothing can be made. If there was a moment when nothing existed, nothing would ever be. God exists necessarily, and since He exists, there never was nothingness.

» "Ex nihilo sui," that is, beginning with its non-existence; "Ex nihilo subjecti," i.e., without even beginning with a "subject" which would be transformable and would be the matter of the change.

value of our knowledge of the world. For science, as well as for common sense, individuals and phenomena are each explained by their relations to the whole universe; and, correlatively, the universe is built up, is involved, and is transformed by its dependence on all these beings and phenomena which, in their relation to the universe, are as members of an organism.

Can we then say that what is contingent can be the sufficient reason of its own existence? Again, we must say that this is impossible. Neither is the universe the sufficient explanation of its own existence, since it is but the unification of its parts, nor are the parts the sufficient explanation of their existence, since they exist and function in dependence on the whole. Science³³ itself recognizes this. It explains the universe by the atom, and the atom by the universe. Neither one nor the other, nor the relation between them, suffices for science, for it supposes them as existent data.

The *second* hypothesis admits a God, but identifies Him with the world. This position is false because it is pantheistic, and we would be forced to accept the following alternatives, both of which result in contradiction. Either the world is necessary, as God must be, and we must declare all the marks of its contingency (extension, qualitative multiplicity, movement) as illusory, or it is God, necessary by definition, who will be contingent, as the world really is.

There remains the *third* hypothesis, which alone is possible, and which alone is true. The Cause of the world is necessary in its existence, and the world is contingent. The world and its Cause are irreducibly distinct. There is, therefore, nothing of the world which is not caused; the world is caused totally, that is, created.

b. *Positively*. All the elements of the world and the entire universe are contingent in their existence. Now everything

³³ See Eddington, *Expanding Universe* (New York: Cambridge U. P., *933), ch. 4, The Universe and the Atom: "Thus we are not dealing with an isolated problem but with a theory which determines at the same time two of the leading constants in physics, viz. the *cosmical constant* and through it the recession of the nebulae, and the *mass-ratio* of the proton and the electron." p. 95.

which is contingent is caused. The world is, therefore, totally caused, in its existence as a whole and in the existence of each of its parts. In other words, it is created. Its Cause is creative. ••

3. *Objections, a. Nothing is created and nothing is lost.*

When one affirms creation, does he not suppress the very possibility of science, by denying its fundamental principle?

The formula expresses experience, and it expresses only that which is within humanly observable limits. Moreover, it does it from a mathematical point of view, and signifies that phenomena can be put into equations. It says nothing of concrete determinations, yet it does not deny that these concrete determinations are born and die in the specifying evolution of the universe. Moreover, it does not prohibit intelligence and organic life from being inventive. Fashioned for the study of a given physical world, it is simply the postulate of the conservation of mass and energy. It can have no wider value than this. By it, the universe is supposed as a *closed system*, and it no longer applies with certitude wherever human liberty is introduced (Cf. Baudin, *Psychologic*, pp. 611-612). It does not at all apply itself to the relation between the universe and its Cause. Because of the given essential contingency of this universe, because of its insufficiency for existence in and by itself, because of its need of a cause distinct from itself, from all points of view the universe can not be a closed system.

b. *It is impossible to make something out of nothing.*

If nothing is taken in an imaginative sense as some kind of matter, then it is impossible. In the sense that the Necessary Being causes the contingent without the use of materials, but produces it in its totality, we see no impossibility or contradiction, because it is necessary. Let us only state that creation is not a clear idea because of the image, which is always used to illustrate it (human making). An image, as such, can only fail us on this point. Here we are confronted with the notion of cause in its ultimate perfection, and this idea implies

* M. GROSS, *Témoignage de j'Univers*, pp. 17-22, 51-53, 260-271.

a negation, which at the same time distinguishes it from all other causality, and makes the idea more obscure than other types of causality.

c. These two objections embrace all the *others*. Whether they be of an experimental nature, as the first, or of a notional character, as the second, the objections show in creation an action whose nature is impenetrable to us, but they are not able to reveal a contradiction there. To be aware that our science is limited is certainly not fully satisfying, but at least it helps us know what it is to realize the aim assigned by Socrates to philosophy. Moreover, every action is impenetrable at least in its relation to creative action. To affirm creation is to situate the mystery in a Being, who, by nature, must be mysterious for man; a Being who draws man away from this world which, considered in itself, is so close to man despite its immensity, and so inferior to man, despite its riches. "If the entire universe should crumble, man would still be more noble than that which would kill him, because man knows that he dies, and that the universe has an advantage over him. The universe knows nothing." (Pascal, *Pensées*: Editions Souriau, 34). If a world which is inferior to man remains an enigma to him, how then do we find it so difficult to admit that a Cause immensely superior to him should be mysterious?

B. The eternity of the world *is not excluded* by the fact that it is created. Such is the thought of St. Thomas as it is clearly expressed in the *Summa* (S. Th., Ia pars, q. 40, a. 1 and 2).

1. *The question* of the beginning or of the "eternity" of the world is very different, actually, from that of its creation. The former is a question of cosmic duration. Was there a first moment in that duration, of such a nature that in going back into the past we would find a term beyond which we could not go, a term where the world began? Or can we go back into the past indefinitely without ever coming to a first instant as a limit? Now the question of creation concerns itself with the world's dependence for complete existence upon a Cause distinct from it, which is demonstrable by reason. The question

about a beginning cannot be demonstrated. It is impossible for reason to demonstrate whether the world began, created *in Unie*, or was created from *all eternity*.

2. *The interest of this question* is first of all *cosmological*. Is time finite or not? It is also *theological*, because the study of it enables us to be precise about the notion of creation. Moreover, its solution decides the value of an argument which is often presented as a proof for the existence of God. It is said that the world began, therefore there must be a God to originate it. But how do we know that it began? Certainly Genesis tells us that it did, but what good is this as a proof for God's existence when we must already admit His existence as the author of Revelation? Thus this argument has no rational value, unless reason can prove the world began.

3. *Can we prove its eternity?* There are those, such as Averroes, who have thought that they could (Cf. Etienne Gilson, *Thomism*). This point of view rests on the idea of the Cause of the world.

a. Whenever one postulates the existence of a sufficient cause, the effect must parallel the existence of the cause. Now God, the sufficient Cause of the world, has always existed. The world, therefore, is eternal with Him. One could understand that the world might not be eternal, if God, in order to create it, had to acquire progressively sufficient energy, or suppress obstacles hindering His action, or wait for an occasion favorable to His designs. God, however, has had in Himself alone, from all eternity, all that is sufficient to create the world. The world therefore is eternal. (*Sec Summa Contra Gentiles*, Bk. II, ch. 32.)

This argument would be compelling, if God did not freely cause the world. But, since God is free to cause it, the duration of the world must be such as He has chosen it to be, whether finite or unlimited. Actually, a free agent conforms his work to his design rather than to his proper nature. God could well have willed that the world should not be eternal, even though He is eternal (cf. *S.C.G.*, Bk. II, ch. 35).

b. The argument presses on : Agreed, God freely causes the world, but surely he has not passed from potency to act in order to cause it, His action being identical to His existence. Therefore, God has always been the Cause of the world, and the world has a duration without a beginning.

We must repeat the first answer and add this precision to it. God has decided from eternity to cause the world, but only with this result, that the world will exist as God has from all eternity decided it will exist.

c. But the precise point is that God has no reason to limit the duration of the world, for He has no other reason for creating except to communicate something of His perfections to other beings, and to manifest Himself to intelligent beings. Now this reason is valid, not only from an original moment of time, but always and eternally. Therefore, God must have willed to create the world without a beginning (cf. *S.C.G.*, Bk. II, ch. 32).

Undoubtedly, God always knew this reason which moved Him to create. He was in accord with it and willed from eternity to create. But if He willed that His work begin, He would not realize the chosen end any less than if He had willed that His work exist without beginning. In the two hypotheses. He communicates and manifests His perfections. He is, therefore, equally free before each alternative. Perhaps He even may have a reason inclining Him to prefer a world with a beginning. Would not such a world manifest more clearly to man and every intelligent creature the supreme liberty of God, the gratuity of His creation, and the absolute independence of the Creator? (Cf. *S.C.G.*, Bk. II, ch. 35.)

Thus none of the proofs drawn from the nature of God as Cause demonstrates the eternity of the world.

d. There were others, drawn from the world, which were presented by Averroës. However, these were based on a world conceived according to the physics of Aristotle, which scientific progress has refuted. Averroës drew another from the eternity of movement, which science could accept. Every movement, according to him, comes from another movement, and therefore

it is impossible that movement should have begun. The formula for the principle of causality, according to Kant, is quite similar : " Every phenomenon is conditioned — it postulates a phenomenon as the condition of every phenomenon. Phenomena being always temporal, this formula returns to the Averroistic postulate of the eternity of movement.

Kant, however, refuted in advance whatever conclusions we might wish to draw from this principle about the reality of things. Phenomenon, for him, is the appearance of things, and it is not a thing. The principle, according to him, asserts the possibility which the human mind possesses of forming chains of phenomena indefinitely. In this sense the principle is true, for it expresses the indefinite in our idea of time. However, he does not affirm that this infinity is real. The Averroistic formula is realistic, but it does not justify its fundamental principle of the real. Without a doubt, experience does not show us any movement that is not the result of another movement. This is a sufficient basis for the phenomenalist principle of Kant, but not for the real necessity which Averroës gives to his. There must be cause for all movement. This is what is necessary. But must this cause be a movement itself? Aristotle saw very well that the adequate cause of movement must be an immobile being, pure act. Consequently, there is no necessity that a movement come from another movement. The eternity of movement could only be a fact, but a fact which would forever remain experimentally unverifiable as well as undemonstrable.

e. Nevertheless, *time* seems unable to begin or to finish. Is each of its moments any more than a link between a duration which precedes it and another which follows it? If so, then a first moment is contradictory, because it has no duration before it.

Or better still, if time began, we must say that nothing existed before this first moment, and there was consequently a succession from nothingness to the existence of the world; but this succession would already be time, and time would have existed before time began. Thus time could not begin;

as it is only the duration of movement, and movement supposes a mobile, the existence of a perpetual mobile world must be affirmed.

The first form of this argument supposes the problem already solved. It supposes that *every* moment is an intermediary, and that none is able to be first (without an anterior duration). Now many changes begin under our very eyes. They have a first moment. Why then cannot the succession of cosmic changes have a first moment?

Under its second form, the argument delightfully mixes imaginary time with real time, but this little play is all imagination. There is not a real succession, nor a true time, between non-being and being. True time is a dimension of real succession which is change. Now from a pure non-being to a created being, there is no change, because there is no enduring subject which becomes (a pure non-being is nothing, and nothing does not become) (cf. *S.C.G.*, Bk. II, ch. 36).

f. *The production of the world* demands an eternal subject (which does not begin at all). Aristotle postulated a prime matter which was ungenerable and preexisted all changes. Likewise, Democritus postulated eternal as well as indestructible atoms. The same is true for the modern materialists, for a host of idealists and pantheists, who hold that the universe always existed necessarily, and it is because of this character that experiment and science are possible.³⁴ The argument in general is this: In order to explain the transformations of which the world is the theater or the totality, there must be something transformable which existed before all transformation, i.e., which did not come from a previous transformation. In order that something begin, there must necessarily first be something which is *able* to begin. Now, this power of beginning cannot itself have begun, since it makes all beginning possible. Thus, according to Aristotle, the "subjectum potentia ens," the subject capable of existing, prime matter, always existed.³⁵

³⁵ See R. JOLIVET, *Le problème de Dieu*, p. 21, which describes the position held by L. Brunschvicg. See also I. M. BOCHENSKI, *Contemporary European Philosophy* (Berkeley: U. of Calif., 1957), pp. 82-88.

This argument is demonstrative only on condition that we wish to explain simple transformations, whether they are particular productions of nature or of art — which after all — is what common experience and science seek to do. If, however, we wish to explain the whole of the universe, and think of its production in existence, its creation, we must recognize the inanity of the above argument. Actually, to create is not to transform. Creation does not suppose an existing “creatable,” but rather the absence of any “subject to be made such and such a thing.” The only thing creation supposes is a God-Creator, the total Cause of all being (cf. *S.C.G.*, Bk. II, ch. 37).

Thus, there is no argument which conclusively proves the eternity of the world.

4. *Can we prove that it had a beginning?* The Augustinians, St. Bonaventure among others, in their reaction against the Averroists, have, in a metaphysical way, attempted to prove that it had a beginning. Many recent apologists, moreover, believe that they have found physical proofs that the world had a beginning. St. Thomas set himself to show the impotence of reason in this matter. For him, the beginning of the world is, in the strict sense, an article of faith. All we have to do is simply examine the alleged reasons in favor of a beginning to become aware of their insufficiency.

a. the metaphysical reasons are drawn :

1) From a creative cause.

a) A cause is *anterior* to its effect, since a cause makes existence. Now God alone first exists, and afterwards, God and the world.

A temporal cause is anterior to its effect : without a doubt.

Is this true of a cause which does not act successively, whose action is identical with its existence? *No*, it is not temporally anterior to its effect. If it is called anterior, it is not in a proper

sense, but in the sense that the cause dominates the effect. To dominate does not imply previous existence.³⁸

b) In creating, God makes the world exist *after nothingness*. Thus there is a first moment, which follows after nothingness.

It is true that God makes the world exist *without using anything*.

But is nothingness *something which precedes the world*? *No*. The image of nothingness, that of imaginary time, carries the whole weight of the argument. No real moment can result from the completely imaginary succession of being after nothingness. Nothingness is the complete absence of existence, therefore it cannot really precede existence. Even in the hypothesis of a world which begins, nothingness does not become the world. If the world began, its first moment is the beginning of the first movement. The beginning of this first movement is the ultimate term of anteriority in time, but it is not at the same time the ultimate posterior term of nothingness. Although all other moments are the fusion of a real before and after, each one completing something of a previous movement and beginning something of the following movement, the first instant of a beginning world can be only a pure "before."

c) God *created after having thought* and willed the world. The real duration of God is anterior to that of the world. There is a moment in the duration of God which is the first instant of the world.

The principle invoked is *false*. There is no succession in God. His duration is immutable and indivisible. For Him, to think, to will, to create, is simply to exist.³⁷ This erroneous manner of thinking is attributable to Averroës, who saw too much similarity between the intellectual actions of man and God.

•• The force of this argument is completely psychological. It is based on our experience of causality. Every cause-object in our experience is temporal. It acts only in becoming or in making something become.

* The argument draws its cogency from the experience of human will, which decides only after deliberation, and then only is there execution. The Divine Will, on the contrary, is devoid of all becoming and succession.

d) *Only God is eternal.* Therefore the world, which is distinct from God, is not eternal, and so it began.

God alone is eternal in the precise sense of *immutability in duration*. But God is not eternal in the sense of *unlimited succession*, since there is nothing successive in Him. It is obvious that the world is eternal only in the sense of an absence of limit in successive duration.

2) The characteristics of the world, especially its succession in duration, furnish new arguments to the Augustinians.

a) The *number of past days* of an eternal world would be *infinite*, but every number is finite, therefore the world began.

Yes, an infinite number is a contradiction, but the past days of an eternal world would not at all form a number. Their *multiplicity* would be *innumerable*, with no capability of being totalized. That's all.

b) But *all multiplicity is numerable*, and therefore the argument must stand. "

Every *actual multiplicity*, given as a whole, is numerable but is a *successive multitude*? It never exists as a whole, and its elements or parts never coexist. The fundamental principle must be demonstrated. No one has done it.

c) At least, an eternal world would never arrive at the present day, unless it had passed through an *infinite series of past days*. Now an infinite series can not be covered, therefore the present day would never arrive.

Actually, only an interval defined by two finite terms can be covered. However, the hypothesis, which this objection envisages, is not that of a world without a beginning. It is that of a world, which, at the same time, has no beginning and has a first term of duration, anterior to every other, from which it must pass to the present day. Now this double hypothesis is contradictory. Suppose the world to be eternal, i.e., that it does not have a first term in its duration. Then it is sheer

* See *Summa Theol.*, Ia pars, q. 7, a. 4.

imagination to speak *of* a passage from this first term to the present day. We must say, on the contrary, that whatever be the day or the term assigned in the past, its distance to the present day is finite, and that the world existed before that, and that we are always able to go back farther. Where is the absurdity in this? It has vanished with the imagination which alone created it.

d) An eternal world would be an *infinite series of causes* producing its present state. Now an infinite series of causes producing a given effect is inadmissible.

This is certainly true if this series of causes is esteemed the *adequate cause* of this present effect. Yet there is no reason to say this infinite series of causes is inadmissible, if it is only the *partial cause* subordinated to a Creator. One can call the adequate cause "The First Cause." By this we wish to say an Uncaused Cause, and not a Cause preceding all others in a successive temporal series. We must relate the world to an Uncaused Cause, but this does not imply that this Cause precedes as a first term all intra-cosmic causes and makes them begin. It implies only that these causes are completely caused, that they are useful to an effect only in the measure that the Uncaused Cause wills to use them as intermediaries to produce it. To be more specific: the linking of individuals of the same species is purely accidental in regard to the last one produced. The cat which brings forth its kittens is as complete and incomplete a metaphysical explanation as the entire sequence of anterior generations, even if they be prolonged indefinitely into the past. Succession and multiplicity of causes and effects make only an accidental difference in causality.⁰ Granted that causes linked accidentally to their effects form a series whether finite or infinite in time, does this change their causality? Infinity does not make causality impossible, nor, as such, does it make causality necessary or sufficient. The infinite duration of a series of insufficient causes is therefore not inadmissible. It would be so, only if the series were given as a sufficient cause without

** She engenders kittens because she is a cat. and not because she has a more or less lengthy genealogical ascendancy.

a Creative Cause. The Creative Cause leaves the series insufficient, but makes it possible by subordination to His creative power.

b. the physical REASONS in favor of a beginning of the world are reducible to the *universal law of aging* which rules the universe.

EXPOSITION

This law can be seen :

1) in the *second law of thermodynamics*, called the law of entropy. " In the universe, entropy increases. " In every transformation, a fraction of energy escapes in heat. Now heat cannot be integrally turned into another form of energy. Consequently, in the degree that time is prolonged, the fraction of energy in the universe, transformed into heat, increases.

Supposing then, that time is without a beginning; all energy would by now have become heat. Now this does not correspond with the facts. Time, therefore, has had a beginning.

2) In the current *astronomical theories*.

a) The theory of expansion beginning with the atom of Lemaître, or the state of Einstein.

If the universe always existed, expansion would have separated the nebulae one from the other a long time ago at speeds higher than the speed of light. In a universe dilated to infinity, we would not be able to perceive any galaxy. We would be in an empty universe, in a universe such as Sitter has described.

We can, moreover, go back to the state of Einstein, or to the primitive atom, and appreciate through calculation the duration which has flowed by since then. We find that the world is between 10 and 100 billion years old.⁴⁰

b) The methods for determining the age of the world, although they are varied, give results which are in accord.

Some of these methods are based on the energy of stars engendering and dissipating heat; on the history of groups of stars, such as the masses in the Pleiades, which are necessarily in a state of dispersion ; and on the study of double stars. " These diverse methods of estimation converge toward the conclusion that there was an epoch in the past, between 10 and 100 billion years ago, when the cosmos, if it existed, existed under a form totally different from that which we know now, and this represents the ultimate limit of science. " 41

c) The current Russian cosmogony lengthens considerably the duration of the world.⁴²

The study of *variable and ex-plosive* stars allowed Kukarkin and Parenago to state their famous law : " The intensity of the explosions is directly proportionate to the interval of time which separates them. " This law shows secondarily that the explosion in all these stars results from the same phenomenon. Calculation and observation have extended the law to certain *novae*, whose brilliance flares out bruskiy from 2 to 13 magnitudes to return slowly to its ordinary dimension. These explosions hurl out a part of the matter of the star, as the sun attempts to do without succeeding when it hurls its protuberances around 900,000 kilometers from its surface. The matter ejected from these explosive stars serves in the construction of new stars, after condensation or capture by already existing masses. Briefly, the same matter serves to constitute successively the different stars, and the duration of the world is, by reason of this process, considerably prolonged.

Can this duration be infinite? Vorontzov says : " No. " He writes : " This phenomenon of creation and dissipation is not a cycle, but a spiral. The universe is not reborn under the same form at the end of a certain time... It changes. The stars which are formed have less hydrogen in proportion to those which were formed long ago. " Like the sun, they transform

41 *Ibid.*, pp. 1x3-114.

42 See *McGraw-Hill Encyclopedia of Science & Technology*, Vol. 4, PP- 330'33»; Vol. 6, pp. 135 ff.

their hydrogen more and more into helium (the cycle of Bèthe), into heat and light. ⁴³

The Russians have not completed this reasoning. Can we imagine that the process of explosion and creation of new stars has always been going on, if we admit a *progressive wearing down* of the explosive?

EVALUATION

Ad 1) The "value of entropy," ⁴⁴ writes a scientist, "is very-debatable and very much debated, for the very simple reason that we have established its properties for only our little part of the universe, our galaxy, or perhaps only' for the solar system of which we are a part. Moreover, we are well aware that extrapolations are not always possible in physics. One has the right to ask if thermodynamics, such as it has been established in our limited frame of reference, is applicable to other universes."

Let us comment on this briefly, a) Scientific laws and forecasts concerning the universe are involved with so much ignorance that they can not be a basis for certitude. Unperceived or ignored causes, which are relatively too small for the short duration of our observations (30 to 40 centuries at the most), can produce, in much longer durations, effects which compensate for those we observe and reverse our predictions.

b) This line of reasoning, however, completely lacks any probative force, because hypotheses other than this one are possible, namely, the hypothesis of a regularity of phenomena in an invariable direction.

(1) In an eternal world, the law of decay can begin to play a role, as in the hypothesis of Eddington (*The Expanding Universe*, p. 58).

¹⁸ Translation from *Science et Avenir*, February, 1955.

^M This is a translated quotation taken from M. Blondel's *La Pensée*, I, p. 287, which reproaches a criticism made by P. Duhem in his *La Théorie Physique*.

(2) The law of the evolution of the world can be as periodic as particular laws. Thus Lemaitre imagines that the stage of equilibrium preceding expansion is followed by a stage of explosion succeeding a maximum concentration. One can suppose an alternation between a stage wherein the world wears down its energy, and a stage wherein it builds up its energy, much like a pendulum which swings up and then falls back.

(3) Finally, decay can be prolonged indefinitely, by slowing down the process more and more, without ever coming to a complete loss of energy. Subtract one half of twenty, and then half of the rest, and the operation is possible indefinitely, because something always remains. Energy could tend asymptotically to its complete transformation into heat, i.e., without ever arriving at that stage.

Ad 2) As to the theories, they are current, i.e., transitory, and others will undoubtedly succeed them.

Furthermore, do these scientific theories assert an absolute beginning for the world? In no way. They are a possible explanation of the origin of our world, at a time, writes Whittaker, "when the cosmos, *if it existed*, existed under a *totally different form* from that which we know." The hypothesis of *another* world, as the origin of ours, is not excluded by science. It could not be. What method could be used to do it?

These theories are not the only current ones. The hypothesis of Hoyle, Bondi and Gold, for example, which is largely mathematical, admits a universe which is incessantly rejuvenated by a deposit of new atoms. They say that nothing can verify it, but is there any fact that will show it false? Does it lack all rational possibility?

To sum up, the science of today does not think that a beginning of the world is inconceivable, but it thinks of a completely relative beginning of our observable part of the universe. Consequently :

- a) it does not prove that the universe had a first moment.

b) it seems to believe that creation is reduced to a *completely relative beginning* of that with which it is concerned. In this context, then, God is no longer known or knowable as God, but only as "He who has produced the present world from an anterior one," not as Creator, but as Cosmic Transformer.

Conclusion. None of the reasons alleged in favor of the beginning of the world or against it have the power of a demonstration. St. Thomas refutes in advance all those which might be invented. One can not, according to him, demonstrate this beginning except from the nature of the world or its Creating Cause.⁴⁴

Now, if we begin with the nature of the world, we must remember that every nature, as thought, makes abstraction of existence, and therefore of real time which is the duration of existence. No nature can demand its not having existence always. If this is impossible, then it is impossible to deduce from the idea of the world that it must have begun.

If we begin with the notion of God, we can go no further toward a conclusion in this matter. God freely causes the existence of the world. The world exists if and when God wills it. But how can we know what God wills? The natural way is to observe the effect of His will, but who is able to assist at creation? Another way is open. God can reveal His will to us, but then creation in time is an article of faith.

This discussion is only apparently sterile. St. Thomas indicates wherein the profit lies. We will not seek to demonstrate the beginning of the world rationally. This could only expose our faith to the disdain of the incredulous, who would think that it is based on proofs as weak as these are. Our attention should be centered on the essential, namely, the creative act. It will show us a universe, which, at each moment, depends on the Divine Will which is Love. Here we are already confronted with a religious vision, instead of perhaps limiting

^{**} *Summa TJeol.*, Ia pars, q. 46, a. 2.

ourselves to imagining this initial moment shooting forth from a "time" which up to now was void. This is no more than a puerile game.

There remains for our consideration the universe as an *ordered whole*, according to the most profound order, that of causality. This causality seems to be necessary and not free. The universe as a system *of necessary causalities*, is n a t u r e.

What is it? How does one explain it?

BOOK FOUR

NATURE

Tenth Question : What is *corporeal nature*?

Tenth Thesis : 1. Corporeal nature is *determined*.
 2. Natural laws are *hypothetically necessary*.
 3. The *order* of nature is one not only of *agents*,
 but of *ends*.

A. Notion

1. *Empirically*, nature is opposed to *art* and to *will*. It is also opposed to *constraint* (violence or force). It is that which is not invented, which is not free, that which is facile and spontaneous.

Etymology agrees with the usage of it to signify that which is innate in existence, that which is there from birth, that which always remains. The immutable, the determined, the constant in an individual, there is its nature !

The notion is extended to embrace all beings. The whole universe is, therefore, thought of as a single nature, made up of all individual natures, the source of their behavior as a whole, the source of their order. Common sense offers no more light on nature and its limits than it does on the limits of the world. Each person fashions this concept of nature in his own way, according to his tastes, experiences or profession. Nature is not identical for the poet and the laborer, for the Christian and the pagan, for the classicist and the romanticist.

2. *The scientific ideas* of determinism, of laws, of evolution, of chance are predicated of nature and viewed as an ensemble of changes. The *determinism* of nature is the regular sequence

and the invariable conditioning of phenomena. The *laws* are propositions expressing the constant relations of phenomena. *Evolution* is the modification of natural types over a course of time. *Chance* is the irregular as it appears in a sequence of phenomena. These last two notions seem contrary to that of nature which signifies constancy and regularity, but at least they are relative to the question of nature.

3. *Scholastic philosophy* defines the nature of a being as : PRIMUM ET PERMANENS PRINCIPIUM PASSIONIS ET ACTIONIS alicui enti intrinsecum. This is substance insofar as it is an active and passive principle. In a general way, nature is identified with essence, nevertheless it must be distinguished from essence, since it signifies a being in its movement, in its active and passive behavior, especially in relation to other beings. Essence is a principle of being, nature is a principle of change.

Nature, as a whole, will be a system of all bodies, considered from the point of view of their mutual causal influences. This will be the universe conceived as the teeming source of events.

4. Catholic *theology* extends this concept in making it more abstract. The term *nature* designates not only all existent corporeal beings, not only all finite beings, even those which are spiritual, but also every created or creatable being, and the ensemble of all created and creatable beings, as well as everything which is related to them by title of a constitutive element or real exigency.¹ The *supernatural* is defined correlatively, as that which is not really demanded by any given nature or by the totality of natures. A miracle, for example, will be an event, a phenomenon, whose origin must definitely be attributed to divine liberty, and not demanded by nature.

* An organism's parts are natural to it as either being constitutive or integral. Cosmic conditions are necessary for the functioning of the organism. Thus, if light exists, or if there is an elastic medium capable of sonorous vibration, there seems to be an exigency that an animal with either eyes or ears or both exists. The Beatific Vision is supernatural in the sense that it can not be demanded, even by human or angelic intelligence.

Our question is purely a cosmological one. It treats of corporeal nature as a whole, and of this alone.

B. Corporeal nature is determined. It has a single constant and habitual way of behaving. In other words, there is a *determinism* in natural phenomena.

1. We have *already established* this determinism *metaphysically*, by linking phenomena to stable principles which are the reason of their specific constancy. These principles are substances endowed with forces and specific properties. *At the bottom* of determinism are *substantial forms*. By reason of its form, each body possesses a specifically determined aptitude to act and to receive, and this is a nature. A nature, subject to a given influence in given conditions, undergoes a determined movement. Placed in relation with another nature, in given conditions, it produces a determined action. To base the determinism of phenomena on specific essences is to show that determinism is possible, and it justifies common sense and science which suppose that it is real.

2. *Our daily lives* constantly verify this determinism in nature. Our bodily gestures which adapt our movement to the conditions of our environment, are in harmony with this environment. Now, whether these gestures be habitual or consciously thought out, they correspond to the conviction that a natural determinism exists, e.g., the gesture of drinking water does not produce an indeterminate result, but precisely the one we are accustomed to. Therefore, this conviction which places us in harmony with our real surroundings is itself in harmony with the real and is, therefore, true.

3. *Science* is true only under the same condition. The laws, coming from the real, return to the real by experimental verification and industrial application. Now these laws are determined formulae. One phenomenon is, therefore, not produced without another. A determined link really joins them.

4. *The very possibility of our true knowledge* of the world proves the existence of determinism. We can know only the

determined. But we can know the relations which unite the diverse elements of the world in their movement and in their causality. Actually, to know is to judge, to attribute, to determine a subject; but to determine a subject by thought, when it is not determined in reality, is not to know, it is to be mistaken. Thus no study aiming at the truth of phenomena could even begin, if their relations were not in themselves determined.

QUESTIONS. What is the rigor of this determinism, that of fact or necessity? (second part). What is its form, causal or final? (third part). What is its scope, limited by chance, or absolutely universal? (first scholium). What is its relation to time; does it escape it, or does it change in the course of the centuries? (second scholium). Finally, what is the sufficient reason for its existence; is it sufficient in itself, or does it demand a cause? (Eleventh Question).

C. The laws of nature are not natural determinism. They are formulas which express the manifestation of it in *the course of nature*. A law of nature is a proposition stating a constant relation between phenomena. It allows us to predict, through deduction, the existence of a consequent following the known existence of an antecedent, or to deny the existence of the antecedent, beginning with the known absence of the consequent. The phenomena linked by the law are phenomena-types, defined abstractly, capable of existing identically (specifically) in an indefinite number of cases. The law is, therefore, not the cause of phenomena. It is a human manner, i.e., a universal way, of knowing them. To human intelligence, which analyzes experience and then reconstructs it, the law shows the facts as linked among themselves in a necessary and determined way. Phenomena form series, wherein one term is the cause or condition of the following one. Elementary series form complex ones. Thus the life of an animal is a very complex series, which supposes simpler series of a physico-chemical, physiological and psychological nature. In a complex series, the elementary series condition one another, as the phenomena differ in each. In their

turn, the very complex series which individuals are condition each other, and, in a similar way, the whole universe is a real unity consisting of the mutual conditioning of all phenomena. This active interlacing of phenomena is comparable to a river whose waters are constantly swirling about at the same time that they are flowing onward to the sea. Such is the course of nature.

Thus the course of nature is experimental data which laws analyze and make us understand through their reconstruction of phenomena. If the laws state the course of nature under the form of necessary relations, that course can not fail to be necessary, at least in the measure wherein it is expressible by laws.

HYPOTHETICAL NECESSITY

1. *Science* shows the real necessity, but not the absolute necessity of the laws which express the course of nature. The regularity of this course is remarkable. However, its constancy is realized, not in permanence, but in succession. It is either a periodic or non-periodic recurrence of the same facts. This recurrence, however, is not absolute. The *law* which expresses it, even when formulated categorically, is *always conditional*. Thus, when I say : Every body falls in a void with the same speed, I do not assert that all bodies are falling and that they are situated in a void. I assert that the speed of a fall is the same for all, but I do not make this assertion, unless I suppose two conditions to be verified : (a) that the bodies of which I speak are actually falling; (b) that they are situated in a void. The constancy of determinism is, therefore, one of the conditioning of phenomena among themselves. Its abstract formulation may be expressed as follows : Given sufficient conditions, the conditioned will result from them. This formula is absolutely necessary, but the laws of nature say *what* these conditions are, and *what* the conditioned is, and they assert that these conditions are actually realized. They are of a kind which necessarily conclude to the existence of the conditioned, when they suppose these conditions to be realized.

a. They are, therefore, *logically* necessary,* but with a necessity which is subordinated to the affirmation of a condition, i.e., hypothetical.

b. They are also *really* necessary, for without this, they would only be theorems, or possible laws; but these are real and natural laws.³ To give a foundation for a hypothetical logical necessity, it will suffice that there exists a real subordinated necessity, hypothetical in itself. What the truth of the sciences permits us to state is simply the hypothetical necessity of natural laws, not their absolute necessity.

Can we say that a law becomes absolute when we succeed in deducing it from a more general law or theory? As a matter of fact, a mathematical truth is absolute; it suffers no exception, nor does it allow any doubt. Does not that which confers this characteristic on it, lie in the fact that it is deduced from principles, as a conclusion is drawn from premises in a syllogism? If, therefore, the laws of nature not only are formulated mathematically, but also are concluded as theorems, which are deduced from principles which are in this case theories, must we not recognize these laws as absolutely necessary? Take, for example, the general law : $S = NX$, " the speed of the propagation of a wave is equal to the product of the frequency N times the length of the wave X . " Doesn't this make the laws for the propagation of sound, of light, of Hertzian waves, etc., absolutely necessary?

This objection rests on a confusion between mathematical knowledge and a knowledge of nature. Actually :

1) A law of nature, even under the form of a most general theory, e.g., that of Einstein ($E = mc^2$) remains contingent in

* In other words, for him who knows them, the *known* antecedent necessarily involves the affirmation of the consequent, its certain prediction. However, *if* the antecedent is not known, or if it is known as not existing, no prediction about the consequent is possible. The law means that an affirmation (the prediction of the consequent) is imposed on the condition that the antecedent exists and is known as such.

³ The logical link between phenomena permits true knowledge. Thus it is that the link which is thought of as necessary among them really exists.

itself, because it states a relationship as really existing. The formula $E = mc^2$ actually does not state a simple conclusion of mechanics, resulting from the combination of definite dimensions : Energy E , Mass m , square of the speed of 300,000 Kms a second c^2 . Such a conclusion would be absolutely necessary, as is the case of every theorem.

However, Einstein's statement is not necessary, for it is that of an existing fact. The proof that it speaks of the "existent" is that we verify it by looking at what we know of the "existent" (already known laws), and by skillfully interrogating the existent in its own language, that of facts (such an interview is called experimentation or observation).

The same is true of the equation $S = NX$. When it treats of a movement thought of as periodic, it is an absolutely necessary truth. Yet when it states a relation between real phenomena, it contains an implicit affirmation which gives it the meaning of natural law : "Periodic movements exist," and by this very fact they are situated among contingent truths.

Thus, theoretical formulae have two senses, one ideal and purely essential, the other real, and at the same time essential and existential. In the first sense, these formulae — by right at least — are absolutely necessary, but they are not laws of nature. In the second sense, they are contingent, and they are therefore laws of nature. They state with a high degree of accuracy the existence of a necessary relation, but they state it as existing in a contingent way. They say what the laws say directly from what they have read in experience, only in a more abstract style.

2) Let us look now at the laws which are deduced mathematically from theory. They can not be more necessary than the theory itself, for a conclusion can not be wider than its premises in extension, certitude or necessity.

These laws appear contingent for yet another reason. Actually, to deduce them, one must add to the theory a second particularizing premise, which is indispensable for arriving at such and such a law. However, this minor premise in the

deduction : (a) is not drawn from the theory; (b) nor is it added to it, except by reason of an intellectual activity which is not forced in any way to these considerations. Thus this minor premise is doubly contingent. In order to apply the formula $S = NX$ either to light or to sound, I must know in some other way (and this "other way" is always experience... and contingent) that light and sound contain a periodic movement; and I must think of joining these two knowledges, the theory and the experience of the fact. It is a case here of one of those more or less abstract passages which Boutroux has shown cannot be made by virtue of any necessity, but only by a contingent synthesis (*Sec De la Contingence des Lois de la Nature*).

Thus, "an actually given being... is not a necessary' consequent following from the possible. It is a contingent realization of it" (*op. cit.*, p. 19). Likewise, the differentiation of being into kinds, and kinds into material species, of matter into chemical types and living things, is made only by adding a specifying notion to a notion which is more abstract. The specifying notion is not contained in the first notion, but is joined to it in a contingent way. The deduction of a law does not suppress the hypothetical character of its necessity. It rather places it clearly in evidence.

No matter how mathematical a physical science may be in appearance or method, it never formulates anything but hypothetically necessary laws about nature, i.e., a determinism in the conditioning of facts. Can a science go further and deny the very determinism of the facts?

PHYSICAL INDETERMINISM

Actually, the reflection on contemporary science, of some of the most illustrious scientists of the day, Heisenberg (1927), Dirac, Eddington, Bohr, has led them to suppose that elementary phenomena are not completely determined by their conditions. They see in their laws, and consequently in all laws, only the laws of statistics, whose necessity is no greater than that supposed in the calculation of probabilities. On the contrary, Lorentz, Einstein and Planck hold that the tiniest facts are completely

determined in themselves, and only the inadequacy of our means of observation prohibits us from measuring their constant relations.

L. de Broglie ⁴ writes : " The new mechanics... no longer constantly attributes a position and a speed to particles in the atomic scale, and it renounces the imposition of a rigorous determinism in the succession of their observable manifestations. " He states : " the almost unanimous accord of a new generation of physicists... on the interpretation of Bohr-Heisenberg indicates that they find this theory to be the only one compatible with the known facts. "

However, let us point out that " for the physicist, determinism exists when the knowledge of a certain number of facts observed currently or in the past, joined together with the knowledge of certain laws of nature, allows him to predict accurately the appearance of such and such a phenomenon in the future. This definition of determinism, as the accurate prediction of phenomena, seems to be the only one which a physicist can accept, since it is the only one that is really verifiable. " Now there are numerous cases today, where " the prediction of phenomena has been considerably diminished in accuracy, if not completely lost. " Prediction still remains in regard to statistical phenomena, but not in regard to elementary phenomena. Thus, when a crystal diffuses electrons which are hurled towards a fluorescent screen, if the electrons are produced in a small number, we can not predict at what points they will strike the screen. If they are produced in great numbers, we can predict exactly the figures which they will make on the screen. Thus, prediction takes place, determinism exists, only for groups, not for the individual facts. This is consequently the latest great step in physics, the discovery by Planck of the quantum of action.

« These translated quotations are found in French in L. de Broglie, *Continu et Discontinu*, pp. 58 ff.; *See Einstein, Philosopher & Scientist*, ed. by Arthur Schil pp. and *Evolution of Physics* by Einstein and Infeld for insight into the contributions of Einstein and Planck.

We cannot record " the constancy of numerous elementary particles, " which " can appear and disappear, " nor can we indicate simultaneously the position and speed of electrons, " which can manifest their presence in the entire extension of an atom. " •

Moreover, we can scarcely hope to possess at some time in the future the means of investigation which might allow us to find again, at this level, accurate prediction — determinism. For we can grasp the real only through means of space and time, and it is precisely the dynamic linking of facts in space and time which forces Heisenberg to formulate the " principle of indétermination " : every precision which belongs to one measure involves a lack of precision in another which is as indispensable as the first, and must be bound together with it to get a close look at the real. •

However, an " undetermined " fact in the physical sense looked at philosophically, is not a fact without a cause. On the contrary it has a proportionate cause, i.e., a cause predetermined to produce it. This cause, however, is not knowable in physical experimentation.⁷

To conclude: Science in the atomic age does not recognize the right to assert that a rigorous determinism links all phenomena, that a knowledge of the antecedents of a phenomenon suffice to predict it. It does not hold that the laws of nature are as necessary as mathematical theorems, nor that they are absolutely necessary. Science refuses to take part in the discussion of the following question : " Are there really undetermined facts which constitute an exception to determinism? " If the scientists give an answer to this question, it is one of personal preference, and not one indicated by their science. This shows, at least, that a purely hypothetical necessity in natural laws does not appear contradictory to them, and therefore the way remains open in this direction.

• See Ernst Cassirer, *Determinism and Indeterminism in Modern Physics*, Eng. trans. O. T. Benfey (New Haven : Yale U. P., 1956), pp. 109-115.

• *Ibid.*, pp. 115-138.

⁷ See Van Melsen, *Philosophy of Nature*, pp. 227-233; Thonnard, *Précis de Philosophie* (Toumai-Paris : Desclée & Cie, 1950), pp. 402-404.

NECESSITY IN CONTINGENCY

2. *Analysis* can proceed further through metaphysical principles and conclusions which have already been established. Phenomenal relations convey through experience the real relations of causes and effects, of "agents" and "patients": contact, distance, equality, etc.; similarity or qualitative opposition...; movements. *There is a necessity* in these relations, because there are corporeal species, which are characterized by constant and necessary ways of acting and receiving. There are, however, *also contingent conditions*, required to "effect" these relations. They are the conditions upon which depend: (1) either the realization of these species in more or less numerous individuals, situated originally in places and definite time, but *contingent in relation to the species*; (2) or the actualization of the individual powers and receptivities which are also *contingent in relation to their existence*. These conditions are, in particular, motor causes present in the world. There is especially one common condition which makes all natural laws contingent, and that is the contingency of the existence of all corporeal beings. A law is only a possibility, if bodies do not exist. Now the existence of bodies is contingent. The law, then, is natural only in a contingent way. It is necessary only from a given point of view. What is this point of view?

It is *by reason of its universality that the law is necessary*. However, its verification in an individual case, taken as such, is contingent. It is necessary only because the individual realizes a specific type, and more generally, because it exists in specifically defined conditions. It is its universality which makes the law necessary and indefinitely applicable.

We can translate this into terms of potency and act. A natural law affirms the real existence of a nature, i.e., a potency in relation to a given function which is its act. It is understandable then that it signifies at the same time:

a. a necessity: because potency is linked to its act necessarily. It is by relation to it that it is defined, and every definition is necessarily true of that which it defines.

b. a contingency : because the potency would not be real unless there were real passages from this potency to act; but such a passage is always contingent in relation to the potency (it is never made by reason of the potency alone : *omne quod movetur ab alio movetur*). Since the natural law always indirectly implies this passage, it is because of this that it is marked with contingency in its very necessity. Necessity is expressed in the general pronouncement of the law. Contingency is especially found in the application of the law to particular facts, which are understood by reason of the law.

Thus the law of nature is always only hypothetically necessary. The system of all the laws and the course of nature expressed through it could not be otherwise. A phenomenal series which is conditioned could form only a system of conditioned necessities. Nature, which is a determined system of causes and corporeal effects, is, therefore, as contingent as the world, the totality of corporeal beings, and clamors for a cause as imperiously as does the world (Eleventh Question).

D. The order of nature is at the same time *causal* and *final*. It is a chain of efficient causes and a hierarchy of ends. The idea of order as used here, is an idea of *regularity*, of *determinism* in the relationships of phenomena and of beings. Everyone agrees in seeing in nature a chain of causes and effects, but many refuse to see there any finality.

This was the attitude of Democritus, for whom atoms were the efficient causes of all things. He sees them as operating by a completely mechanical, undirected necessity, with no concern for end or chance, which is conceived as the suppression of an end. Paganism had scarcely the power to elevate itself above such a conception, when it made even the gods subject to an inexorable destiny. The great Socratics attempted bravely to give a precise role to mind, which Anaxagoras had affirmed as the effective source of order. But their God remains little capable of penetrating a matter which he has not created, or of making his ideas succeed. However, they are the first who give finality its rightful place in philosophy. For Plato, bodies

participate in Ideas and The Good. For Aristotle, physical natures tend to activate themselves by their basic "appetite," described as a "love" for Pure Act. This is the End, which is the only first cause of their movement.

Christian philosophy will attach all nature to that foresight and that free will of God which is called Providence. In St. Augustine, the Platonic Ideas become the exemplary Ideas which God regards in Himself in order to create beings on their pattern. They also become the seed-ideas (*rationes seminales*) which the history of the universe will bring to flower in species and successive states, and which are the divine program as it is realized step by step. In St. Thomas, the Aristotelian substantial forms become the incarnation of ends or Divine Intentions in matter.¶

The decline of finality was produced in two areas which were for a long time united. The sciences of nature, because of the mathematical method, and later because of positivism, wanted no other explanation than a mechanical one. Philosophy, which turned to deism or even to pantheism, left nature to evolve without direction, moved by an absolutely rigid determinism. This double attitude shows up in Spinoza, who excludes all finality from "natured" nature, because he must make room for liberty in "naturizing" nature.

Nevertheless, *there is a finality* in nature.

1. *There is a finality* in nature, for the external cause of a corporeal substance is not only a body endowed with activity, but also an orientation to produce a determined effect (See pp. 135-137). For example, the succession of substantial generations, which is a part of the natural order, is at the same time a causal series and a system of objective ends. The role of an end is at the same time to orient the cause and to determine

¶E. Gilson. *The Spirit of Medieval Philosophy* (New York : Scribner, ch. 7, pp. 148-167, shows very clearly what an upheaval in the philosophical conception of finality came about through the idea of creation.

See also Ch. Boyer, *Essais sur la Doctrine de St. Augustin*, ch. 4. a very precise study of "seminal potencies" in Augustinian cosmology'.

the effect. Thus a living thing is oriented when it differentiates its reproductive cells, which have a specific potential and a determined orientation.

2. But *the problem* here is *greater*. We are treating of the whole of nature, of all its movements, and of all its activities. Is the general order of nature a pure mechanism, a fatal chain of antecedents and consequents? Or must we, in order to express the truth, recognize in it the direction of a finality, a kind of tendency, similar to the power of choosing?

The answer in favor of the second hypothesis is true, because :

a. Change demands a cause as a sufficient reason, and this not only in regard to getting a change going, but in regard to every real determination that appears in the course of that change. Now a cause which is conceived as efficient is abstract and lacks its most concrete characteristics. An efficient cause, by itself, is a cause which is incompletely determined, and thus imperfectly proportioned to its effect. In reality, nevertheless, it suffices, and therefore really embraces a determination which does not reveal to the mind its efficient character, i.e., an orientation to produce not only *some* change, but *this* change which is completely determined. To admit this is to admit that there is in a cause a determination which is not of the efficient order, but which directs and orients efficiency towards its entirely determined effect. It is to admit the presence of an end in the cause, which will be realized in the effect.

The more manifestly change is oriented, so much more clearly does it demand an end which orients it. Thus the history of the universe, which contemporary science offers as probable at some stages, and certain at others, appears to be guided in a constant direction, that of differentiation. Why, at each stage, is there progress rather than a stop or regress? Mechanical inertia, "the tendency of movement to conserve itself in an invariable manner,"* is evidently impotent to explain differentiation.

Let us suppose that nature is without direction. Would it not attempt all the combinations which are mechanically

possible? But what is the probability that a more differentiated state would be achieved by this play of chance? We might answer this question in the form of a comparison. The owner of a house destroyed in a bombardment calls for new squadrons of bombardiers to reconstruct his home from the ruins. Since his house is one of the possible combinations of the existing materials, is there any chance of its being restored by successive explosions, and some additional chance that it will stay that way despite successive bombardments? In a like manner, in a movement presumed to be without finality, nothing definite or stable could exist. The universe, however, has a history. It has passed through stages which have endured. Its movement has, therefore, a finality. •

b. *The contingency of natural laws* leads us to a similar conclusion.

1) Among the laws, the most fundamental are the definitions and the classifications, which express real specific structures. Now an infinity of species is simply possible. *Real* species are contingent facts. They are real not by reason of their constitutive parts and their proper activities, but by reason of a determination which has placed them in existence through a kind of selection. Therefore, nature, as a system of species, contains a finality.

2) Other laws express the relationships between diverse activities. Are the conditions of these relations necessarily realized? In no way! A determination over and above their nature must be added in order that they be actualized, an orientation which makes them coexist, in a word, a finality. Thus, the affinity of Cl and of H is not sufficiently determined by their chemical species. It exists also by reason of certain conditions of localization, of simultaneity, concentration, warmth, light, etc. Now each of these conditions is realized by its own proper causes. Its meeting with each of the others and

• In the simple sense of "directed by an end" (under any form whatsoever, whether as thought or not, whether utilitarian or not), *end* is here that which predetermines a particular result (finality of destination).

with all at the same time is possible, but it is not made necessary, nor even effective by its own realization. (It is not because Cl and H occupy the same place that they are there at the same moment, etc.). Moreover, in order that the law of affinity be a real natural law, it is necessary that the conditions for the combination HCl be realized, and even that their union be repeated. There must, therefore, be a *link* existing between the causes realizing these conditions, making them work in unison, despite their mutual independence from the point of view of efficiency, a link which is precisely the means of realizing a common end, i.e., a link of orientation, of a finality which envelops and directs them.

In other words, the diverse as such does not explain unity. Diverse motor causes (which are causally independent) regularly combine to present a single effect, e.g., the combination HCl. Therefore, they are not simply diverse. They have a unity which is not in this order of efficiency where they are diverse, but in an order which determines them, in a word, a unity of direction, an end.

The order of nature is, therefore, not only a mechanism of causes causing one another. It is especially a system of ends in which each end unifies certain particular actions and forms, and which taken together unify the system itself, which we call nature.

E. Does chance exist, or is determinism an absolute universal law which applies to the most individual facts, with no exception?

Very many profess an absolute determinism. Goblot says : (1) " The order of nature is constant, and its laws suffer no exception. (2) The order of nature is universal, and there are no facts or details concerning these facts which are not regulated by laws. Constant and universal, the laws of nature are completely deterministic. " A. Cu villier states : " Either determinism is universal, or it does not exist at all. " This last assertion, nevertheless, is a hypothesis, " a postulate, " " a calculated risk, " which humanity " cannot fail to run without

renouncing its power over nature and its understanding of the universe." However, is this power unlimited, or this understanding perfect? A negative answer leaves the question of chance open.

1. *Chance is at least an appearance.* Fortuitous events, writes the mathematician Emile Borel, are those which depend "on causes which are too complex for us to know and study completely." Here, chance means an *unknown cause, an unexplained fact*. Science is not resigned to ignore it completely. It subjects these phenomena with unknown causes to the calculation of probabilities, and applies to them the laws of statistics, which will allow a prediction concerning a certain number of facts taken together at one time. Thus, we can have an approximation of how many individuals will be born in the United States this year.

Chance has even taken a preponderant place in experimental science today. In days gone by chance was taken as being somewhat exceptional, but it is the order of the day now, especially when treating of the phenomena of elementary particles. "All physical phenomena are... dominated by the fundamental law of chance." "This unique law of chance simply consists in this: extremely improbable phenomena are never produced."¹⁰ This universal role of chance in physics is summed up in Heisenberg's principle of indétermination. In biology, the Mendelian laws on hybrids, the chromosome factors in heredity, biological measures, constantly conform to predictions based on the calculus of probabilities, and thus show the enormous role of chance in nature. We can make further precisions on that role by distinguishing:

- a. The macroscopic domain, where deterministic prediction is possible.
- b. The microscopic and ultra-microscopic domain, wherein we must rely only on statistical prediction.

¹⁰ The two statements quoted are translations of E. Borel's *Le Jeu. la Chance*, ch. 5. *Le Hasard et la Science*, p. 168 and p. 98. See also E. Schrodinger, *Science and Humanism* (New York: Cambridge U. P., 1951), ch. 2, pp. 39-51.

Thus we can predict an eclipse of the moon, but we cannot predict the time when a certain atom of radium will explode. We can only calculate the probability of its explosion in the next hour. We are held to the same type of calculation as to predicting the manifestation of an electron at some point of the wave with which it is associated.¹¹

Consequently, there is no doubt that chance manifests itself everywhere in science, and it is an appearance founded in nature.

2. *Is chance something real?* In other words, are there unexplainable facts? Let us make a distinction. Absolutely unexplainable facts? Certainly not. The principle of sufficient reason cannot be placed in doubt. A completely unexplainable fact would be without a sufficient reason. Relatively unexplainable facts?, i.e., facts lacking a *-particular* kind of explanation? Let us answer this by being as precise as possible : (a) A fact can not lack its *constitutive reasons*; (b) anymore than it can lack *all productive cause*, and *all finality*, since it is, and since it is such, and not another.

But nothing prohibits it from lacking this particular productive cause, or this particular determined finality, which could have been its sufficient reason as well as the cause which it actually has. A fact, then, will be produced by chance, if it is produced as a result, without the causes seeming to have in themselves a determined orientation to produce it as it is.

3. *A more exact notion* of chance demands a more precise view of finality, the absence of which seems to characterize the fortuitous event.

This absent finality is not any finality at all. *It is the finality which we expected*, that which gives us the why of the fact. We can verify this by distinguishing two domains of chance : man and humanity on the one hand, and nature on the other.¹²

¹¹ See VAN MELSSEN, *Philosophy of Nature*, pp. 233-241.

¹² See HAMELIN, *Essai sur les Éléments Principaux de la Représentation*, 2nd. ed., pp. 322-330.

a. Human events contain the element of chance in the measure in which we suppose them to be guided by an intention, by a desire, or at least an interest. An event happens by chance when, being able to be guided by a human intention which would explain it, it occurs without this intention, or even contrary to it.

Thus, Peter finds a treasure while digging the foundations of a house. Paul is killed because, in leaping from a plane, his parachute failed to open. This particular shell failed to fire. An intention was lacking in the event which would have explained it, or an intention was inefficacious in an event which it should have regulated (the parachute, the shell).

For an absent human intention, we sometimes substitute a super-human one, which is either benevolent or malevolent. We speak of good fortune, of luck, of ill luck, of "bad luck," of "fate."

b. Natural events are fortuitous in the measure that they are unforeseeable in their individuality, or unknowable by a definite combination of laws. Such are the elementary facts which science predicts only statistically, as individually endowed with a definite probability.

Thus, a second generation of rats, which follows a crossing of white with gray, furnishes as an average 25 % white, 25 % pure gray and 50 % mixed gray. Now, the reason that a particular individual will be pure white is due to a fortuitous meeting of chromosomes at the time of the fecundation of the first generation female. Likewise, it happens by chance that the second generation contains about 25 % pure whites, which percentage has been predicted statistically.

We expect nature to proceed according to rule. We understand an event when a law shows it to be necessary. That which explains it to us is the predetermination of its causes, its natural destination. However, we perceive this destination only at the level of the universal, of the specific, of that which is repeated. That which is strictly individual remains obscure for us and escapes precise prediction. Face to face with an individual event, we wait for the universal to explain it for us.

We find the universal, and, first, we feel that the event is explained, but then there is a silence about that which is strictly individual. Natural finality does not cross the threshold of the individual. Our meeting with the the individual, as individual, is made without natural finality, and is therefore fortuitous.

For example, I understand the fecundation of this ovule of the dog rose by the germination of a grain of pollen of the same species. I understand because I recognize in the ovule, as in the pollen, a predetermination, a specific finality. However, when I think of the individuality of each of these two organisms, and give them a number, as might be done to players on a field, then I can not see why pollen 1834 happened to be joined to ovule XIX, and I understand even less why anthrozoid B rather than A has fused with the oosphere. * I know well that there are mechanical causes, forming an unbroken chain, which have led P 1834 into contact with Ov. XIX, and B into contact with the oosphere. These are *results*, whose causes, even if known in detail, would leave me unsatisfied, for what is still lacking is the precise finality which destined P 1834 to come in contact with Ov. XIX, a destination capable of being expressed in the fashion of a law; in short, an idea, an end, being realized throughout the course of a causal series.

Thus in the different chances, a finality which we expect to encounter at their source is lacking, whether it be a finality of intention, or a finality of natural destination. It is always at the level of the individual that chance shows itself. Its place in human activity is limited only by intention or the idea, which effectively regulates a concrete event, whereas its place in the activity of nature is limited only by natural destination or the specifying directive idea (which is synonymous with substantial form). This is simply to state that in this case the strictly individual is normally fortuitous, being irreducible to species.

* At the moment of fecundation, the reproductive nucleus is divided, within the pollen tube, into two anthrozoids, of which one is fused with the oosphere and the other with the secondary nucleus of the embryonic «ac.

4. *Notable definitions of chance.* Commenting on Aristotle's reflections on chance,¹⁴ Hamelin sums up his doctrine in this fashion : " A fortuitous event is that which is not really taken as an end by any efficient cause; something which is produced because it is a mechanical dependence of the end pursued by the efficient cause; and something which, in itself, could be pursued as an end. If we designate chance as the cause of a fortuitous event it can only be in the sense of an absence of all teleological activity. " Thus, chance, according to Aristotle, is only a mechanical effect having the appearance of intentionality.¹⁶

Cournot, in a famous definition, insists on the mechanical aspect of chance. " The events brought on by the meeting of other events, which belong to a series which are independent of each other are what we call fortuitous events or the result of chance. " He does not clarify this " independence " of the series, which is the very heart of his definition. It is perhaps because it is difficult to speak of the " independence " of causal series without referring to ends. Let us at least attempt a distinction here, which may clarify the point we wish to make. These series are independent, since the causes do not have as their destination, their end, the single result to which they lead. These series are, nevertheless, dependent one upon the other, since the causes are linked in a system which has produced this single end. Thus the pollen and the ovule of the same species form a system in view of the reproduction of the plant; but pollen 1834 and ovule XIX, insofar as they are individuals, escape the grasp of the idea of the end. Their meeting is by chance.¹⁴

* See Aristotle's *Physics*, Text and Commentary, edited by W. D. ROSS (Oxford, 1936), pp. 353-355 and PP- 514-5»9.

¹⁶ See *Physics* of Aristotle, Bk. II, ch. 6, 197b, 1-35.

¹⁴ " A phenomenon resulting from the cooperation of several causes, which are really independent, will be a fortuitous event, if no principle intervenes which unites the independent causes among themselves. Now this principle, not being able to belong to the order of causality, since causes linked to one cause ... are not really independent causes, can only be an end. " Translation of quotation from *Essai sur les Éléments Principaux de la Représentation*, by Hamelin, p. 32S.

5. *The existence of chance* is, therefore, verified and already partially understood. Chance is real, but it refers to human knowledge. It is an *aspect* of events which human intelligence cannot grasp, inasmuch as these events have no sufficient reason to explain them. To affirm the real existence of chance is to affirm a limit to the intellectual penetration of the human mind, and correlatively, a limit to the intelligibility of the real. *In the direction of things*, the clearness of form, idea, and end, is obscured by spatio-temporal conditions in which the individuality of matter is presented to us. *In the direction of man*, his intellectual power is measured by a dependence on the sensible, and fringed with indetermination because of the mind's necessity of grasping being in the universal. For these two reasons, which are in reality one, finality is, for us, indiscernible at the individual level, except under the form of a personal intention.

Chance is, therefore, a fact which implies a causal explanation, and even an incomplete finality, but not a final explanation. It is a result, but not an end. It is a mechanism which lacks a certain finality. It is definitely based on the indetermination of space and time, i.e., on their indefinite divisibility, which makes possible an infinity of encounters between causes and between moments of their actions, and which, on the other hand, does not demand any single encounter to be preferred above all others. It is chance that the rain begins to fall exactly at the moment a raven croaks.

Chance and determinism thus express two authentic aspects of nature, the individual and the universal. Determinism and natural law's represent only a fraction of the real, and to attain the other part, science can only have recourse to the calculation of probabilities.

F. The evolution of determinism at first appears less real than chance, and the invariability of laws more absolute than their universality. Moreover, there seems to be a contradiction in a determinism which is not a fixity.

1. *An evolution in determinism is not contradictory.* To suppose that absolutely necessary laws evolve is certainly

contradictory. However, there is nothing surprising in the assertion that hypothetically necessary laws evolve. Actually, their necessity hinges on the existence of certain conditions. If the conditions can change, the relations which express these laws can also change.

2. *An evolution of natural laws, in a chronological sense*, is certain. Here we place ourselves at the point of view of the history of the universe. To speak of evolution is to accept the fact that different laws have prevailed successively in the course of the universe's duration. Cosmogony admits the successive appearance of laws by affirming a multiplicity of cosmic stages. The laws of sidereal rotations came after the laws of electronic attraction and repulsion. The laws of life came after the laws of mineral matter. Different laws began successively in the course of the ages. Paleontology, particularly, teaches that living species began to exist on earth at different geological periods. The laws of biological structures show an evolution which, in general,¹⁷ is a progressive differentiation.

3. Is *evolution through descent* also a fact? Evolution, in this sense, means not only succession, but the *genealogical* dependence of successive biological types in relation to a primitive undifferentiated biological type.

Evolution on a small scale is that which produces varieties and sub-species, and which is capable of being directly observed. This is called mutation.

Generalized evolution is held by the majority¹⁸ of biologists as an historical fact : " That which constitutes the true *a -posteriori*

¹⁷ It also implies regressions (parasitical species, for example) and stagnations (there are " panchrone " species, which have passed through all the geological ages without variation).

¹⁸ Nevertheless, there are still biologists today, who take into consideration the enormous extrapolation which such a transformism supposes. See *Revue des Deux Mondes*. Sept. 15, 1953, the article of Dr. Vernet, and an article in the same revue for July 1, 1954. by Charles Richet. Since 1929, Louis Vialleton's book has been a protest against what he calls "the transformist illusion," and gives importance in the evolutionary process only to the secondary diversification of formal types. See also L. Vialleton, *L'Origine des Êtres Vivants*.

proof of generalized transformism is the rigorous concordance which exists between the epoch at which a group appears, and the place which its organization assigns to it" (L. Cuenot, *La Genèse des Espèces Animales*, 3rd ed., p. 75). The historical documents used are fossils, which *paleontology* studies and dates. It gives particular attention to what it calls orthogenesis, i.e., successions of types which vary in a definite direction, which is said to be progressive if the biological type becomes more complicated, and regressive if it becomes simpler. The classic example is the series of forms which leads up to the horse by the increase in size, in the length of the teeth and the middle toe, as well as by the reduction or loss of other toes.* The historic proof is completed by *embryology*, which establishes a parallelism between the successive historical forms of life and the successive stages in embryonic development. Studies in *comparative anatomy* and *biological chemistry* point up the more or less close relationship existing between specific types, and invite us to explain it through the unity of a common ancestral stock (cf. Cuenot, *ibid.*, Part II).

In this domain the final word belongs to the biologists. From a philosopher's point of view, these remarks must be made :

a. The *fad* of a *chronological* evolution producing diverse species at the precise moment which their degree of differentiation assigns to them is not and can not be directly observed in fossils. As a matter of fact, in the oldest sedimentary layer of the earth, the pre-Cambrian, we find algae and invertebrates (crustaceans and mollusks), types of living things which are already very differentiated, if we compare them with what must have been the first type of living thing. There is no direct way, however, to observe simpler forms of life. From the Devonian period, vascular cryptogams and gymnosperms are present without a trace of them being present in the fossils of the preceding ages. The same is true of fish and the first

*M. Grison in his *Problèmes de l'Origine*, pp. 115-147, explains the principal scientific evidences employed to substantiate transformism, especially those found among the oviparous gastropods called paludine, the equidac, and proboscideans. Read *Species Revalued* by Desmond MURRAY, O. P. (London : Blackfriars Publications, 1955), ch. 4, pp. 35 ff.

amphibians. It is impossible to observe the progressive arrival of biological forms according to the order of their increasing differentiation, unless we begin with vegetal and animal types, which are already differentiated. Moreover, there is even an absence of documents on the links which bind mammals and birds to any ancestors who might have been contemporaries with the reptiles of the Secondary Age.

The observable paleontological series is orthogenesis. It is situated always within a definite type, and shows variations within that type, which are often "extra-specific." In these conditions, to assert a generalized progressive and specifying evolution as a fact is to go considerably beyond the evidence. The theory of evolution must be accepted for what it is, a plausible, a possible explanation of the history of life.¹⁰

b. To assert that the successive *forms* are the *generators* one of the other, is to come dangerously close to the fallacy of "post hoc, propter hoc," by giving a causal explanation to a phenomenon simply because it precedes another phenomenon. That there must be cause for the appearance of these living phenomena is evident. That the cause of a particular form is a less differentiated form which engendered it is less evident.

To bolster the evidence, we must be able to grasp *how* the parent species manages to engender a species more differentiated than itself. We must furnish *the factors* at play in the transformation of species.

4. Admitting *evolution* as a fact, *does it have a scientific explanation*, is it subject to laws, is it deterministic? The biologists think so, and they are right. Orthogenesis manifests a determinism as clearly as the facts of heredity.

Still we must be more precise about the nature of this determinism. Is it simply a mechanism of causes and effects, constructing species as pure results? Is it a determining influence,

¹⁰ A view somewhat similar to this one of R. Collin in his *Panorama de la Biologie*, p. 181. is expressed by G. Barry O'Toole in his *Case against Evolution* (New York : Macmillan. 1928). Read Ch. 3 of this book, "Fossil Pedigrees," and especially pp. 126-127.

a kind of moving and directing idea which guides biological transformations?

a. There are a great many who think that the *causal determinism* in evolution is absolutely universal, i.e., that nature contains within itself all the causes required to constitute an evolving mechanism. Causes form a mechanism on condition that their series be continuous, and that the antecedent is always the sufficient explanation of the consequent which follows. In order that evolution have a mechanical explanation, these two conditions must be verified. If the series is not continuous, or if one of the terms is not the sufficient explanation of that which follows, a mechanical explanation of the process can only be partial. We must, then, either : (a) admit successive evolutions separated by the interventions of an ultra-cosmic cause, by " creations " (the word is used widely here, as designating a divine efficiency modifying already existent species), or (b), look for an addition to this partial mechanistic explanation in a finality, and in a Liberty choosing a system of specific ends to be realized biologically.

Now, no one has proven the impossibility of a mechanical explanation of evolution. We prove only that an efficient mechanism can not be an adequate explanation, and that here, as in the case of the mineral world, an Uncaused Cause, a Creator, is necessary for the foundation of the mechanism. But neither has anyone proven the existence of such a mechanism. It can be proven only by explaining this mechanical chaining of biological events, and showing that its elements are real. In this field, science is still almost completely ignorant.!

1) *Lamarckism* (Lamarck, 1744-1829) asserts that life evolves because : (a) a living thing reacts to variations in its environment, (b) it thus adapts its own body; the use of an organ increases this organ, while its non-use destroys it, (c) and finally, because the individual's acquired characteristics are hereditary.

" For an explanation of the theories of evolution, read " Theories of Evolution " by C. H. Waddington in *A Century of Darwin*, ed. by S. A. Barnett (Cambridge, Mass. : Harvard, 1955), pp. 1-18.

However, "experiments... are clearly contrary to the hypothesis of a more or less immediate patrimonial inscription of acquired characteristics through the soma (i.e., the body, exclusive of reproductive elements)" (CvÉNOT, *ibid.*, p. 269). Lamarckism, then, is deprived of its real indispensable basis.

2) Darwinism (Darwin, 1809-1882) gives first place to the struggle for survival as a factor in evolution, and he sees this factor as achieving a natural selection among forms which are slightly different in the same species. Death eliminates the weaker biological specimens in the struggle for existence, and so only the stronger and more differentiated forms perpetuate themselves through the ages.

Experiment, however, shows that "death is selective only in a very small measure," and "selection, far from being constructive of new species, plays the role of conservator in the average type of biological species" (CuÉNOT, *ibid.*, p. 29 and 295). Death does not choose, except by respecting among the individual variations, those forms which are "preadapted" to resist certain harmful actions or modifications of the environment.

3) Thus, today, the most important factor in the evolutionary process is considered to be *preadaptation*. We recognize the importance of *mutations* in the division of a species into races or varieties,²³ and that of the *differential fecundity* in species according to their geographic locations and their succession.

Yet, we are still ignorant to a large degree about the causes of these preadaptations, these mutations, these variants in the

"It is not a question here of the acquiring of an organic or functional adaptation, which would bring up the Lamarckian factors, but rather of the innate presence, in particular individuals of a species, of characteristics which would assure them of an advantage against harmful causes, e.g., climatic conditions or actions of parasites. Thus an animal with a dark pigment is "preadapted" to the intense solar light, which would burn an animal with a light pigment.

B "Mutationism rejects the explanations of orthogenesis proposed by Lamarck and Darwin. It denies any hereditary nature to acquired characteristics found in the group and denies any constructive role in the process of natural selection. However, there is nothing plausible to put in its place" (translated quotation from A. Burloud's, *De la Psychologie à la Philosophie*, p. 102).

reproductive power. Is it in nature alone? Or is it at the same time a combination of nature with something beyond? In a word, is evolution, as a global fact, scientifically explainable, i.e., as a causal determinism? The scientist believes it is. He does not prove it. As to the philosopher, even if he knows that nothing has its adequate cause without God, he is not forced by that to accept the occasionalism of Malebranche. He recognizes in bodies a determined activity, and moreover, he sees no contradiction in the idea of one species engendering another (See Seventh Question).

Thus, it is impossible to say whether evolution is subject, in its entirety, to the mechanical determinism of efficient causes.⁸⁴

b. In any case, there is a manifest finality in evolution. It happens that the scientist himself recognizes the insufficiency of causal determinism in explaining evolution. "That which is especially lacking²⁴ (in mechanistic causal explanations) is the natural factor which explains *that which is new*, which explains the *directional* and the *intentional* in the unfolding of life.... This nature is neither logical nor economical.... What is difficult to understand in orthogenesis²⁰ and in evolution in general, is the direction which they appear to follow, that

M The Hologenesis of D. Rosa seems to many to be the most perfect logical form of generalized transformism. This theory pictures the primitive living thing as enclosing within itself the potential of all phylogenetic evolution, even as each individual egg contains within itself the potential of ontogenetic evolution. The differentiation in species would come about in a way similar to the differentiation of tissues and organs beginning with the initial cell or egg. "This construction, as expounded above, is largely in the speculative order." writes R. Collin. in his *Panorama de la Biologie*, p. 181.

A fairly detailed explanation of this theory can be found in R. Collin, *Mesure de l'Homme*, pp. 93-110 and in *Découverte de la Vie* by P. de Saint-Seine, pp. 119-121.

s. "The known factors of evolution take into consideration that which is called micro-evolution, i.e., the origin of variety and of the transformation of the latter into a species" (translation from L. Cuenot's *La Genèse des espèces animales*, p. 328).

*Here, we can think of the duration which spans the orthogenesis of Equidae: some sixty million years. Could completely mechanical chance maintain such a steadfast direction through a transformation which takes on thousands of small acquisitions?

kind of *preordination* which reveals itself from the beginning of a series, and which leads to organs whose finality is as manifest as the wings of a bird or a bat." (Cuénot, *ibid.*, pp. 327-329.)

We must see a finality to the work of evolution. There is in the series a number of independent causalities involved, yet there is in the same series a unity whose action realizes the diverse biological types.³⁷ The unity of the type produced would be contradictory without a certain unity in the causes. Looked at from the view point of efficiency, the causes are independent. The unity which they have is a common determination of their individual efficiencies. It is the unity of a plan, of an order, of an end. This finality is all the more remarkable, inasmuch as it adapts itself to, and even utilizes, chance : thus, very often, death strikes the eggs and the young of species by chance. The work of nature is constructed and is continued in these undetermined conditions, and shows itself as being superior to them, as a contingent determination, as a non-necessary choice.

Evolution, if it is a natural fact, reveals with a greater clarity than any other natural phenomenon the finalist and mechanical nature of determinism. Its laws manifest their contingency in a twofold way. These laws replace themselves with the very biological types which condition them; and they are constructed, even as the types themselves, depending on the contingent modifications which prepare them. Evolution, more than any other natural phenomenon, demands a cause. But all of nature also demands a cause, since all its laws are contingent. Could this cause be found elsewhere than in Liberty? **

n We can make the following distinction : (i) Internal series (chemical and physiological : irritability and mobility) forming, as a whole, the evolutionary potential of a species. (2) An external series, the differing factors of environment (water, light, warmth, oxygen, and the conditions of their variations) as well as the vegetal and animal species inhabiting the same geographical area.

*•In us liberty creates the contingent and explains it. Would nature, which is contingent in the very heart of its being despite its apparent necessity, be explainable without a liberty which creates and guides it?

Eleventh Question : What is *the cause of nature?*

- Eleventh Thesis : 1. The determining cause of nature is a *Creative Liberty*.
 2. Its end is the *perfection of man and the glory of God*.

A. Notion

1. Liberty, in the *empirical* sense, is sometimes the power of doing, and sometimes the power of choosing.³⁹ It is always a relative liberty, which finds a limit on this side of contradiction. We have no experience of an absolute liberty, which would be that of the Almighty, even though we might have the illusion of it in the feeling of creative invention.

2. *Scientific* psychology backs up common sense, when, through a delicate analysis, it establishes the existence of free will. It goes farther when it places liberty in the power of making a choice in intellectual conditions which explain the possibility of liberty but in no way force consent.³⁰

3. *Metaphysical* psychology sees in liberty the highest degree of spontaneity. Spontaneity is a causal power which is proper to a being. It manifests itself in the independence, as minimal as it may be, of the action of an individual in relation to its conditions. Liberty is the highest of spontaneities. It is, actually, the independence of choice in regard to its nearest conditions, which are intellectual motives.

St. Thomas has founded human liberty on the analysis of the rational knowledge of the good, which is the condition of willing. He would not have been content with the definition of liberty which Leibniz was to form : *spontancitas intelligentis*†9

19 In the first sense, a horse is free when he has broken out of his stall, a prisoner, when he is freed or escapes. In the second sense, the internal choice is free and consequently the external act which it realizes.

⇒ Free will is not that which follows in a determined fashion from the strongest intellectual motive — or from the best — nor is it that which is indifferent to motives. It is free because of the simultaneous influence of motives, which it experiences, and because of the domination which it exercises over them.

(spontaneity of knowing). If the will can only follow wherever the intellect recognizes the good, it is obviously not free. But reason also grasps the good as partial and limited. Therefore the will has something to follow, since it can not be indifferent to the good which is its proper object, but there is nothing which forces it to follow a limited good. It is free, then, to choose this means, which, in advance, does not satisfy it, since it does not give the good as absolute, but a mixture of good which carries with it an evil¹ which repels it. Liberty, here, is spontaneitas eligentis (the spontaneity of electing). Choice is an original function, distinct from knowledge. Wherever knowledge does not grasp the idea of a means as necessary to the idea of an end, there is freedom to choose.

Nevertheless, human liberty is not complete independence. Although man is free, he appreciates motives and is dependent on his body. Moreover, it is through sensation that he acquired the very foundation of his ideas, and it is through society that he learned the values of numerous motives. Wherever knowledge is dependent on objects which are distinct from the subject, the liberty, conditioned by this knowledge, can not be completely independent.

Nevertheless, there is a perfect liberty, an absolute independence of will, in the Being who in thinking finds the full content of thought in Himself, and chooses the realization of His ideas, without this choice being the necessary result of His nature or His thought. God has such a liberty. Theodicy will study this aspect of God formally. Let us now try to grasp, in nature, the incontestable traces of this sovereign liberty.

B. Demonstration. Three steps lead us to this conclusion.

1. *The cause of natural determinism is intelligent.* This determinism in nature is at the same time a finality as well as a causality. Now intelligence alone is the adequate reason of an end. We can, undoubtedly, imagine that the finality

" Evil " is understood here in a psychological sense, as the lack of a possible good. Thus duty, which sometimes deprives us of a satisfaction, is perceived as a psychological " evil. "

of the universe finds its immediate reason in an intelligent reality, e.g., in the determined state of a previous universe, or in a kind of blind destiny; but this reason would not be sufficient, and we must come to an Intelligence which conceives natural ends and implants within them corporeal activities. Why? Because an *end exists before its realization*; it exists, in its manner, before being incorporated either into a substantial form united to prime matter, or into the ensemble of phenomenal relations expressed by natural laws. Its préexistence is indicated by the orientation of the efficient cause. This manner of existence which is proper to it is immaterial and is related to the intentional order.

Moreover, the finality of nature is what makes phenomena intelligible. As a matter of fact, what does our mind uncover in stating a law which enables it to understand phenomena, unless it is something intellectual, something expressible in an idea? There is, therefore, something in nature equivalent to ideas incorporated into matter, ideas which are the structures of things, and which are, at the moment when these structures are formed, the guiding plans of constructive activities. Now, how can ideas be in matter, unless they have their source in a Mind which thinks them? Matter could well be modeled in their image, but it could not confer these ideas unless it were mind itself. Our intelligence does not create natural laws, nor the essences of things. It does not even know them, except gropingly.

Idealism understands well that the object of intelligence can be, after all, only a participation in Intelligence. In this it is in accord with exemplarism which attaches all essences, possible or real, to intelligible ideas, which since the time of St. Augustine have been identified with Divine Intelligence.

2. Intelligence, which is the adequate source of determinism, *chooses determinism in nature freely*, because it does not conceive any necessity for choosing this determinism.

a. Actually, intelligence is the *sufficient reason* of determinism in nature. It receives nothing from nature, nor does it have any need of it. Intelligence is independent of nature.

If intelligence were dominated by the necessity of this determinism, it would be dependent on it, and therefore could not be the adequate reason of the determinism itself.

b. This *determinism of nature* is, in itself, *contingent*. It is one of those things which were possible and which remain so. In the passage from the possible to the actual, intelligence recognizes no necessity. To pass from possibility to actuality supposes that a will which acts and realizes be linked to thought.

Must we say that the will chooses necessarily only the most perfect, and that reason alone explains the why of such a choice among all possible finalities? To do so would be to fall into the illusion of a finite world being the most perfect possible. Although the finality of determinism is certainly the highest of the world's perfections, nevertheless, in a finite world, that degree of perfection can not fail to be finite itself, and consequently no necessity exists for choosing this determinism of preference over any other. If we were to suppose something as perfect, or even more perfect than nature's present determinism, it would still be finite, and would never be imposed on intelligence with necessity, i.e., as the only thing possible for the judgment of reason.

c. Moreover, a *determinism* in nature *supposes* that certain individual natures, as well as an ensemble of natures, are realized. Now their existence depends on a *Creative Cause*, which cannot fail to be completely *free*, because He causes an effect in all that it is. Thus determinism is suspended from a Creative Cause. Why?

3. The liberty on which determinism is based is the Liberty of a creator.

a. As a matter of fact, to create is to produce existence in all that it is. It is to make being in its nature, its activity, its passivity, and consequently with its own proper determinism, which is in accord with universal determinism.

The Creator, who is the adequate Cause of the universe, is, by reason of that, the adequate Cause of its laws. It is.

therefore, His free choice which assigns to each nature its end and to all nature its order.

b. However, we must be more precise. The finality of nature is not added to a being from outside, as is the artificial finality of a tool. It is the being itself in the specific direction of its becoming. Consequently, to assign to each nature its end is nothing more than to form a being with its specific properties. To assign to the universe its order is nothing other than to constitute an ensemble of natures linked by their active and passive properties. Therefore, it is not a new choice which endows the universe with its natural determinism. It can only be the very choice which created the natures.

The liberty upon which determinism is based is, therefore, definitively the free choice by which God created the world such as He willed it to be.

The creative act is thus a free act, a gratuitous gift of God to the universe. The liberty which rules over determinism is totally independent of it, since it creates the very beings which it orients to their ends. (Cf. *Summa Theologica*, § pars, q. 14, a. 8; q. 15; q. 19, a. 3 and 4.)

Thus we can conclude with Hamelin, " that God has made Himself God, i.e., Creator, and that we must render thanks for His having made Himself God. Undoubtedly, God must exist as an Absolute Spirit, but He is not, nor can He be a necessary being, unless the Absolute Spirit is absolute Goodness. "

C. The beauty of the world.³² " Through this doctrine of divine liberty, " writes Emile Boutroux, " the contingency**

** " Beauty " ought to be taken in an analogical sense. The human experience of the beautiful has a double aspect, which is both sensible and intelligible. The beautiful is " quod visum placet, " and it is also " splendor veri. " The beauty of the world remains a sensible beauty : a flower, an insect, a human face, a starlit sky; but the beauty of the world becomes more and more completely intelligible, in proportion as it is extended to its entirety. Thus the beauty of the world is revealed more to the scientist than to the ignorant. It appears truly only to the religious man, who sees in it the reflection of the visage of God.

shown in the hierarchy of forms and of the general laws of the world, is explained... The entire world seems... to be a rough draft in imitation of the Divine Being, but in a symbolic imitation, such as a finite essence would demand... The beings in nature do not have as their unique end simply to subsist throughout the obstacles which surround them, or to bend to conditions outside themselves. *They have an ideal to realize*; and this ideal consists in bringing themselves closer to God, to resemble Him, each in its own way. The ideal varies with different beings, because each has a special nature and can only imitate God in and through its proper nature... Because there is for all beings of all degrees an ideal to be pursued, there must exist in all a degree of spontaneity, a power to change proportionate to the nature and the value of this ideal...

Therefore, in every region of being, essences and laws have two aspects.

In the physiological world, life is not reduced to an ensemble of observable functions. It is basically an internal power, which tends to realize in the bosom of each species not only those forms which are most useful to the beings themselves, but also the most beautiful which that species allows.

In the physical world, properties are veritable powers for changing states, for combining and separating, tending to realize not only the most stable forms, but also the most beautiful which the nature of bodies can allow.

In the mechanical world, force is not only the expression of the observable relations between movements; it is also an effective power tending to realize the beautiful by translating it into the language of extension, figure, symmetry and movement.

It must be pointed out here that the principles of physiology, of physics and of mathematics do not have an exclusively material sense and an *a posteriori* origin. They have beyond that an esthetic sense, and from this point of view, an *a priori* •origin.

As for the idea of necessity, it will be, basically, a translation... of the action exercised by the ideal on things, the action of God on His creatures. " 3*

Under the light of creative liberty, the world appears as a work of art, a beauty, a cosmos according to the full power of the Greek word; and God appears as an artist sovereignly free in His ideal, Master of his materials, and as the infinitely rich Splendor which is refracted in a thousand different rays in the beauty of the world.

" Singula sunt pulchra secundum propriam rationem, id est secundum propriam formam. Unde patet quod ex divina pulchritudine esse omnium derivatur. " — " Quia enim Deus propriam pulchritudinem habet, vult illam multiplicare sicut possibile est, scilicet per communicationem suae similitudinis... Omnia enim facta sunt ut divinam pulchritudinem qualitercumque imitentur " (St. Thomas, in *Dc Divinis Nominibus*, ch. 4).

" ...let them know how much the Lord of them is more beautiful than they " (Wis 13, 3).

D. The end of the world. Can we be more precise and say *what* the general finality is that God has given the world?

1. It is God Himself, without any doubt. Only the Absolute Good could be the ultimate end, for no end is an end, unless it is directed to the final end. No passage, no evolution can be finished except in achieving the unsurpassable Good.

Likewise, every agent takes itself for the end of its work. But the whole of nature is the work of God. Therefore, God wishes it for Himself. M

2. How is this? A thing can be an end in two ways : as a good which is lacking and needs to be produced, e.g., health,*

* The above is a quotation taken from E. BOUTROUX's, *La Contingence des Lois de la Nature*, and put into English by the translator, pp. 157-168.

* *Summa Contra Gentiles*. Bk. III, ch. 17. There exists an English translation of this work : *On the Truth of the Catholic Church* (Garden City, N. Y. : Hanover House, 1955).

in the practice of medicine; as an existing good to be obtained, e.g., nourishment for the hungry.³⁵

God did not have to be produced or perfected by the evolution of the universe. He lacks no good. He is the Creator of the good in the world. Can it be then that the world is seeking to become divine?

Certainly not in the sense that it is able to make itself God. But can it become similar to God, by acquiring some of the perfection of God? Since it is an effect of God, it ought to resemble its Cause.³⁶

Actually, the beings of nature resist destruction as much as they can. This is an imitation of the imperishable being of God. They change and acquire new determinations. This is an unceasing march towards the infinite perfection of the divine. They act and are the causes of all kinds of effects. This is a relationship with creative causality, a relationship which associates them with God in the realization of the end which is proposed; a relationship more apparent in living things which give to their effects the power to cause life in their turn; a relationship which is higher and almost spiritual in the role which nature exercises on human intelligence, to which it presents the materialized reflection of the ideas of God.³⁷

Since the divine perfection is infinite and perfectly simple, while that of created being is limited, it is necessary that the universe multiply its perfections, in order that it be, in its totality, an image approaching the divine perfection.³⁸ So it is that we find this host of species among substances and, in each species, this infinity of individuals; this indefinite aptitude for new forms, which characterizes prime matter, whose appetite for new forms can not be appeased, although momentarily calmed by the form possessed; so it is, that we find every substance receiving the accidental determinations coming to it

« S.C.G. Bk. III, ch. xS.

“S.C.G. Bk. III, ch. 19.

”S.C.G. Bk. III, ch. 21.

’•A. Ancel, *Métaphysique Générale*. pp. 720-723 and 728-731.

from cosmic causes; this aspect of mutual aid between substances, so pronounced in the universe, which constantly seeks to establish unity between species and individuals; so it is, finally, that we see this history wherein the universe achieves differentiation, order, riches, little by little, until such a time as man appears to continue it and bring it to a spiritual and personal perfection which is closer to that of God. '•

3. Is it, then, through man that the universe attains its end?

a. *St. Thomas* clearly teaches this. He exposes it from two points of view :

1) Prime matter, first of all, is in potency to the form of an element (which we today call an elemental particle); thus disposed, it is in potency to a mixed form (which we call atom, then molecule, and then "organic" molecule); under a mixed form, it is in potency to a vegetable soul; disposed by the latter, it is in potency to a sensitive soul. Finally, disposed by a sensitive soul, it is in potency to an intellectual soul. This potentiality is shown in the process of substantial change, and, especially, in human generation.

Now, in a universe where beings are subject to generation and corruption, we find no form more elevated towards which matter is directed than "humanized" matter. "It is, therefore, the human soul which is the highest degree of all cosmic generation, it is that to which matter tends as its final form... Man is thus the end of universal generation. '•⁴⁰

2) The conservation of things shows a similar order. Beings which are the materials for the construction of a superior being also help in its preservation. Man makes use of all kinds of beings, for nourishment, clothing, means of locomotion, working instruments, etc. "And above all this, the sensible universe serves him in the realization of an always increasing intellectual knowledge. "

»»S.C.G, Bk. III, ch. 22.

* S.C.G, Bk. III, ch. 22.

b. This is true, *but we are hardly concerned here with any more than the terrestrial world*, the sun and the earth. What use does man make of the rest — the vast invisible reaches of the universe? The far-off galaxies are neither materials for his body nor aids in sustaining his life. This is true even of the planets, which are citizens, like the earth, of the solar city.⁴¹

Must we suppose that, scattered through the far-flung archipelagos of our universe, there are other solar and planetary systems inhabited by some kind of reasonable animal? Some astronomers have fancied such an hypothesis, but there have been few facts to give it much confirmation. Yet could we say that it has any solid probability? ⁴²

c. Our evaluation would be decisive if man were constituted the absolute end of the universe, and especially if he were considered under the title of chief member of the universe. But if man is marching towards a future beyond the universe, and this by reason of his knowledge and the free orientation which it allows him, then *two truths* emerge, which *clarify the difficulty* :

1) The *whole* universe, as vast as it is, serves man with matter and light for his thought, and serves also as educator and guide for his will. The far-off galaxies are, for him, witnesses of the Almighty Power and Sovereign Liberty of the Creator.

2) The universe penetrates the thought of man via sensation, and attains God and glorifies Him through man. This will be more completely the case if man must attain Beatitude not only in his spirit, but in his resurrected body as well.

d. *We can conclude* : The universe would have no finality without man. As a matter of fact, what good is a universe teeming with almost unimaginable riches, if there is no being able to know it, and through it, to know God, its Designer? Undoubtedly, it would be known by God, but it would teach

“ A. Ancel, *Métaphysique Générale*, pp. 6S2-6S3.

“ *Science et Vie* (December, 1954), p. 526 and *Revue des Deux Mondes* (January, 1955)-

Him nothing, would give Him nothing. Could pure spirits know it, and because of it, praise God? No. Pure spirits can receive nothing from a material universe, since they are immaterial and have no senses with which to come in contact with it. If they knew the universe, it would have to be through a direct revelation from God. Thus it would seem useless for the universe to exist if this were the situation. When we see a face, we have nothing to learn from a mirror which reflects it. The universe has no meaning, no end, unless there exists an intelligent being who forms his thought through sensations. It is certainly man who gives the universe a meaning, a finality.

4. Will the world, then, come to an end? Will it, one day, cease to exist, leaving no traces? An affirmative answer to this is likely, if we consider that man will not always inhabit the earth, and that all organic life will disappear from the universe. Thus it seems that the universe would have lost its reason for being, and could only be annihilated.⁴³

However, this would be considering the universe only under the aspect of a passing service to a humanity on the march. Once arrived at this perfection, would humanity lose interest in its birthplace, in its mother earth, in its teacher and the vehicle of its ideas? Or, must we not, on the contrary, conceive a universe perpetuated through matter which has become stabilized, and which the resurrected bodies of men will have as an object for their returned senses? This, undoubtedly, is a secondary theme, but completely natural for man's intellectual, esthetic and, especially, religious contemplation.

Nevertheless, the world will have an end in a true sense. The precise relation which links it with terrestrial man will definitely cease. If it is, actually, for man, an aid, a light, a guide, it is also an obstacle, peril, enigma and temptation. But it is man, inasmuch as he is on his way towards his proper end, who gives to the world this twofold value. Once man is perfected, so will the world be; but since man will endure forever,

‡ A. Ance1, *Métaphysique Générale*, pp. 728-731.

both body and soul, once he is perfected, then it will be necessary that the world also endure forever; but perfected even as he, with him and through him, for his happiness and, therefore, for the glory of God.

CONCLUSION

We have sought to know the nature and cause of the corporeal world.

No light has seemed superfluous among those which reason has projected on these problems. The confused witnesses of ordinary sense perception, once analyzed, have furnished us with precious evidence. The lights of the positive sciences, which are more precise than the former, but oriented by method to other questions, have directly revealed nothing of what we are looking for. Science seems intent on depriving us of empirical data, by imposing other empirical data, which are different and even contrary at first glance. However, if, like those first data of experience, they issue from a reasonable source, then they can only agree with them and be added to them definitively.

Once real data have been collected, they must be understood.

The reality of substance and of multiple phenomena which modify it imposes hylomorphism. No violence is necessary to explain organic life in the context of this doctrine. Living or not, the corporeal individual is an essence composed of prime matter and substantial form which is at the same time specific and individual.

The existence of individuals which begin placed us before a new mystery. Bodies are causes of passage to being, of beginning. They are not at all causes of existence, or of all that is in existence. They are not even the cause of the determination of their own activity, i.e., of their own natural finality.

Is the world, so imposing in its totality, going to furnish the complete explanation of the existences contained in it? Not at all! It reveals its contingency and, therefore, its insufficiency to explain the mechanism of efficient causes. It exists only in dependence on a Creative Cause.

Nature, in its turn, unveils the contingency of its determinism, and, by that, its inability to establish the orientation of its movements. It exists only in dependence on an Intelligence which wills it in full liberty, and which reveals the splendor of its beauty in the multiple facets of nature.

Therefore, the metaphysical study of the world can not be completed in a consideration of the world. It must be continued in the rational study of an intelligent and free Creator whose existence, from now on, we will take as established.

Thus, cosmology leads us to theodicy.

APPENDIX

**THE WORLD AS SEEN BY MARXISM
AND EXISTENTIALISM**

Two contemporary positions offer us a vision of the world, completely different from that which we have just expounded, which has been largely extracted from scientific discoveries, thanks to the intuitions of the Greeks, and Christian reflection.

To use these contemporary positions in the construction of a system would be difficult. They are not made up of theoretical theses, and are not especially concerned with metaphysical problems. They are philosophies of action and practical conduct. They have an aim, and they judge everything according to that aim, combating as erroneous every judgment which is opposed to theirs. In this, they are not very open to a discussion which would seek to distinguish the true from the false. One does not discuss an aim, one chooses it. Marxism is one choice. Existentialism is another.

This choice, however, is also expressed in ideas. Even if this choice is simply lived, it still shows directing ideas. There is, therefore, at least an implicit and lived metaphysics found among the Marxists and the disciples of Sartre.

To know is not useless. The knowledge of contraries is science itself, says Aristotle. Truth stands out in bold relief against a background of errors. In error, there is ordinarily some truth, no matter how disfigured or contaminated. That which resists error in error itself proves to be a truth which is natural to human reason. To be acquainted with some of the crossroads in this labyrinth of contemporary thought will be useful for directing one's own thought, and helpful in guiding others.

I. THE MARXIST WORLD

Karl Marx (1818-1883) and his friend Engels are the founders of Marxism. Its great authors, who, in their way, may be likened to the "Fathers of the Church," are Lenin and Stalin.

A. Dialectical materialism is the Marxist method set up in opposition to metaphysics, and claiming to be simply the reflection of the material world's characteristics on the human mind. Its four fundamental principles, according to Stalin,¹ are the following :

1. Consider each phenomenon in its indissoluble link with its conditions. "Nature... is a united and coherent whole, wherein objects... depend on each other, and condition each other reciprocally." *Absolute determinism.*

2. Consider phenomena in their development, i.e., as forming a history, wherein there is an unceasing cycle of birth, development and death. Nature is an "incessant development." *Universal evolutionism.*

3. Consider this development as leading to more and more complex and differential qualitative states, by means of quantitative changes. Nature transforms quantitative growth, necessarily and by leaps, into qualitative changes. Thus water at 100° C. turns from liquid to steam. *Evolutional progression.*

4. Consider this progress as produced by contradictions, which are inherent to objects through a struggle between contrary

¹ See G. A. Wetter, *Dialectical Materialism* (New York : Praeger, 1960), ch. 3, pp. 311-333, also J- V. Stalin, *Dialectical and Historical Materialism* (New York : Int. Pubs., 1940), pp. 7-15.

tendencies. The objects and phenomena of nature " all have a negative and a positive side, a past and a future. " *Synthesis of contraries*.

Only this fourth principle merits at most the title of dialectic. It is borrowed from Hegel, but is used in a sense opposed to his ideas.¹ For Hegel, it is the idea which is differentiated, in passing from one notion (thesis) to a contrary notion (antithesis) in order to raise them all at once to a richer notion (synthesis), and which, by this very fact, constitutes the becoming of nature and human history. For Marx, on the other hand, nature replaces Idea (God). It is nature which is differentiated, and because this is so, it furnishes the human mind with its rule of knowledge, and even the very condition of its existence.

B. Materialism is the philosophical doctrine of Marxism, which is at the same time the heir of the ancient materialism of the Epicureans (Lucretius), of the Encyclopedists (Diderot, Helvetius), of the scientists of the 19th century (Haeckel, Le Dantec), and yet in qualitative opposition to it by reason of the suppleness of its new dialectical method.³

The ancient materialism was " mechanistic, " because the mechanical sciences were the only ones which were sufficiently developed. Hence its effort to reduce all change to local movement, and its illusory conviction that nature always repeats the same movements. Contemporary science has proven just the opposite. There is a qualitative progress. There is a real history.

However, the essential characteristics of materialism remain in Marxism :

1. *Matter and matter alone really exists.* " Space and time are the fundamental forms of every existence. An existence outside of time is as monstrous an absurdity as an existence

* See G. A. Wetter, *op. cit.*, p. 358, and p. 365. See also F. Grégoire, *Hegel et Fierbach*, pp. 26-71.

• See G. Politzer, *Principes Élémentaires de Philosophie*, pp. 1x3-116; C. Angrand, *Cours de Philosophie*, Intr., pp. 19-24. These two works are destined for the formation of militant Communists.

outside of space. " 4 This is the cardinal dogma and conclusion of pure empiricism.

2. " *The independence of matter in relation to mind and the dependence of thought in relation to matter* " 6 is the second dogma inherited from the past, which is supposedly backed up today by scientific experience :

a. In biology, we have evidence of " a number of movements which are accomplished in an entirely mechanical way, without any kind of thoughts. " 6 The behavior resulting from instinct and habits is made up of simple determined reactions to excitants in the environment.

b. Moreover, life and man are comparatively late-comers to the cosmos. They are " the product of a very long evolution. " Intelligence is formed gradually, as living structure becomes more and more differentiated.

3. " *The impossibility of the creation of the world* " is a third dogma, and hardly different from the preceding two. " A God would have to exist to create the world... there would have to be a moment at which no moment could possibly exist. " Moreover, " no one has ever had any experience with the mind which is asserted to have created the atom and space, therefore, it does not exist. " 7

4. "The world and its laws are perfectly knowable: ..there does not exist in the world a thing which is unknowable, *only things* which are still unknown, which will be discovered and *known* and employed *through scientific means*. " 8 All this is a denial of Kant's position on " thing-in-itself, " which he sees as the unknowable heart of phenomena, and is an outright proclamation of scientific dogma. Science and experience will

* F. Engels, *Anti-Dühring*, p. 62.

* J. V. Stalin, *Dialectical and Historical Materialism*, pp. 15-16.

* In regard to reflexes, see L. L. Woodruff, *Foundations of Biology*, P- 377. PP- 466-467. pp. 552-553-

' Translated quotation from C. Angrand, *Cours de Philosophie*, Intr., p. 24.

• J. V. Stalin, *Dialectical and Historical Materialism*, p. 17.

put an end to all mysteries. No other knowledge than scientific knowledge has any value.

Through this dogma, we can understand such formulas as the following :

" The materialist philosopher, like our own Encyclopedists, has the mission in every age to make known the results of science to all... That is his task... he is a popularizer of the sciences. " " Materialism is nothing more than the scientific explanation of the universe. " " Materialism is the scientific conception of the world, " and again, " We must choose between God and science. " •

And still more specifically : " Marxism is a scientific sociology, implying a history, an economic theory, and a scientific politics, " in a word, science as it is applied in the regulation of human affairs.¹⁰

This reciprocity between science and materialism is professed with the same bigoted intransigence by G. Tessier, when he says : " Science must be materialism. " Those who are most tempted to look for a finalist solution among the scientists are the biologists. Now those who often " try to keep themselves neutral on this question, or attempt a type of agnosticism, drop it as soon as they begin to work, and conduct themselves in their experiments as honest materialists. " ¹¹

C. Consequently, matter, in the eyes of the Marxists, is entirely explained or explainable by the different sciences, and in particular, by the general evolution of the universe.

And every scientific truth is also interpreted as a confirmation of dialectical materialism.

1. The generalized relativity of Einstein shows each event as dependent on all the regions of the universe. Thus a

* Translated quotations from G. Politzer, *Principes Élémentaires de Philosophie*, pp. 21, 34 and 57.

••Sec G. A. Wetter, *Dialectical Materialism*, pp. 249-253.

¹¹ Translated quotations from G. Tessier, *Matérialisme Dialectique et Biologie*, p. 7. See also G. A. Wetter, *op. cit.*, pp. 442-469.

justification of the first principle of the dialectic : " Everything acts on everything else. "

2. The second principle of Carnot expresses the irreversibility of evolution (second principle of the dialectic) : " Nature always evolves towards the most probable states. Consequently, nature is purely mechanical. It has a blindfold over its eyes — in other words — God does not exist. " 11

3. Quantity is changed into quality. A host of particular facts testify to this. The last addition of weight to a mass breaks the rope which supports the mass; every critical value attained at the time of a qualitative change produces a new quality; the novae explode brusquely because their energy has gone beyond a certain determined level.

Every biological evolution which terminates in human thought is done by a similar passing over of a host of qualitative thresholds : matter, life, sensation, thought.

4. The struggle between contradictions is inscribed in the facts of equilibrium, from heavenly bodies, which are drawn towards a center, whether of their galaxy or their planetary system, and maintained at a certain distance by centrifugal force; to atoms, whose negatrons are held to the nucleus by electric attraction, yet kept away from it by reason of their rapid rotation around it. It is again the same struggle which is indicated in the facts of explosion, of materialization of energy, or of the creation of energy by the loss of mass.

Thus " nature operates dialectically and not metaphysically. " w

5. However, materialistic determinism admits a certain difficulty in maintaining its position in the face of some of the new conceptions in physics.

" The recent quantum theory, which criticizes determinism, has been the signal for an armed rising against materialism. "

11 Translated quotations from Fr. Halbwachs, *Matérialisme Dialectique et Sciences Physico-Chimiques*, pp. 4, 6, 10, 13, and 16-19. See also G. A. Wetter, *op. cit.*, pp. 416-424; pp. 436-442.

12 Translated quotation from Fr. Halbwachs, *op. cit.*, pp. 21-22.

In particular, the relations "of non-certainty" show that "the particle possesses a certain margin of liberty within which it escapes our vigilance." "With the wave theory... we are content to learn what the chances are for finding a particle at such and such a point, or for determining the probability of its presence." 14

Here is the answer : " We are completely indifferent to the theoretical possibility of perfectly knowing the position of particles. For us, the world is something other than the knowledge of it. As a matter of fact, *we believe* in the nature of things, and only one truth binds us, and that is, that things have a cause and effectively obey laws... Lack of certainty on our part in no way implies indétermination. " 14

Although it can not be said here that science *imposes* determinism, nevertheless, we believe it, because it is " a characteristic of matter, which is fundamental for the building of a materialist conception of the world. "

On this point the Marxist must recognize that he is venturing beyond the frontiers of science. He is in the domain of faith, and it is in this domain that we find any profession of absolute determinism.

D. Life will be explained in the same way by a twofold plan of spontaneous generation and an evolution of species, realized without any finality, through a blind determinism.

1. The criticism of finalism consists principally in this : All progress in biological science lies in the discovery of a deterministic explanation, which throws out the finalist theory, and obliges it to fall back to another position.

Thus, biology has shown that every physiological function is " accomplished by a succession of physico-chemical pheno-

" *Ibid.*, p. 19.

" *Ibid.*, p. 23.

» *Ibid.*, p. 22. See also in regard to matter above G. A. W r i t e r , *op. cit.*, pp. 406-415.

mena. " Thus species are formed mechanically, as is taught by " Darwinism... today more alive than ever. " 17

2. The affirmation of determinism is posed as indispensable to science.

" How would we be able to work at science, if we did not believe in the reality of the material world, if we did not believe that this world is intelligible, that it obeys knowable laws, if we did not have the certitude that no supernatural legality is superimposed on natural legality, that... no God could ever falsify the laws of matter, nor impose His movement on it? " 18

Biology is invoked next to substantiate the four points of the Marxist dialectic. Particularly : " the case of metamorphosis, a violent crisis interspersing the development of many species, shows very well the place which the logic of contradiction and the principle of qualitative progress through leaps, ought to hold in biology. " Thus the tadpole is changed into a frog, as soon as the concentration of thyroxin, which has been increasing bit by bit, has reached a determined level.¹⁹

Briefly, life is completely explained as a necessary succession of phases, which become qualitatively richer and richer, from the first appearance of life to a highly complex molecule, or in the progressive formation of the diverse species, or in the development of an individual from an egg.

" With our evolutionary conception of the universe, there is absolutely no place for a creator or a law-giver, " writes Engels. When speaking of the " Origin of Species, " published by Darwin in 1858, Marx, as well as Engels, had this to say : " It is this book which holds the natural foundation of our theory. " ²⁰

¹⁷Translated quotations from G. Tessier, *Matérialisme Dialectique et Biologie*, p. 4.

¹⁸*Ibid.*, p. 7. The intelligibility of the world is here reduced to determinism.

¹⁹*Ibid.*, p. 12. See in regard to the above quotations, G. A. Wetter, *op. cit.*, pp. 448-451.

²⁰Translated quotations taken from *Correspondance Marx-Engels* (Paris : Costes), VI, p. 117.

E. Discussion

1. *Some truths* which appear in the development of Marxian materialism can be heartily accepted. No one has thought to deny them with the exception of a few idealists.

a. Matter exists really distinct from the mind. This is against Berkeley and the absolute idealists, Hegel, among others.

b. An experience with matter is indispensable for anyone who wishes to know nature. It furnishes man with a true knowledge of the world, at least in part, which is transformed into science. This is against the “thing-in-itself,” as proposed by Kant.

c. Matter is a nature, i.e., it is transformed according to a determined order, which makes it knowable for us and expressible in scientific laws.

d. Nature, in general, is a movement, a union of contraries, a progress wherein richer and richer qualities come into existence, an irreversible concrete time constituting a history, and finally an authentic determinism.

2. *But*, if Marxism, with reason, revindicates these truths of common sense, against Hegel and other idealists, it does wrong to monopolize them as its own private property, or as its very own discovery, especially when it aligns them with grave errors, of which the following seem to be the principal ones.

a. *Science* is the complete knowledge of nature; therefore every metaphysical question is useless, and every ultra-scientific statement absurd. Nevertheless, this critical position contains a twofold metaphysical affirmation :

1) Existence in nature is expressed completely in the characteristics of space and time, in phenomena, wherein nothing exists which is not spatial and temporal.

2) Experience, as man undergoes it, is sufficient to constitute science, and man need not contribute anything to it by a personal contribution, by a spiritual activity.

As all scientism, Marxism can exclude metaphysics only by professing two metaphysical dogmas. If these dogmas were true, there might at least be room for discussion — but even the existence of science condemns them.

There is no science at all, actually, unless it is universal. A scientific law does not announce a single fact, whether past or future. True, it makes individual facts understandable, but only by arranging them in a class of facts. A law has neither sense nor truth, unless the nature of which it speaks implies a repetition of the same facts found in the definition, unless there is something really existing in it which absolutely goes beyond these present conditions of space and time.

But if the existence of a nature implies the universal, still nature does not contain the universal as a particular piece of space and time. Therefore, the human mind must give to the universalizable element in nature its proper universal character. There must be an activity which is neither spatial nor temporal, which goes beyond this point and this moment, in a word, an activity which is altogether different from material activity.

b. *Absolute determinism* is no longer justified by science. Science is content with a partial determinism. To affirm a complete determinism is, again, to make an affirmation which is no longer scientific but metaphysical, such as the statement : " The whole of reality is knowable through the mediation of laws. " But if science can not of itself either condemn or affirm the hypothesis of absolute determinism, reflection on the characteristics of a law forces us to recognize that the strictly individual necessarily escapes law, and can not be predicted except through statistics and the calculation of probabilities.

c. Finally, the *description* of facts is *taken as an explanation*. To describe the evolution of an organism by pointing out the more and more differentiated states, which it possesses one after the other, is certainly to reveal something which is true. The same is true of describing the history of the universe and the history of biological species. In this description, more always follows less, *in this sense*, that more always comes from less and

is explained by less. Thus it is that I understand this water is boiling because I recall hearing it whistling earlier.

However, there is another kind of explanation. Let us take electric current as an example. If the latter were cut off, the fact that the water whistled in the kettle could not lead me to the fact that it was boiling. And the current itself will not be explained without a reference to the directing idea which installed the turbines at the foot of a waterfall, and without the other idea, which was my intention to be supplied with boiling water.

Why then does Marxism hold that the description of evolution and that of the laws of nature are a sufficient explanation? To have recourse to a blind necessity, or to a complete determinism, is simply to take the easiest way out, as when one answers a child : " It's so, because it's so. " So, science is finally summed up in this single answer. Can that satisfy the legitimate and even obligatory curiosity of man?

Moreover, does not the man who knows have the duty of questioning himself about the use of the power which science gives him? But according to what criterion will he judge such a use to be good or bad? He must have some other knowledge than science, a knowledge which supposedly satisfies his curiosity about " Why, " " Value " and " Finality. " No, chronological succession is not the only explanation of nature. This succession has not, *in itself*, any meaning, and therefore it can not make us understand anything. The knowledge of it, however, is useful, because it makes us know *what it is to* understand, and because it furnishes those who wish to understand with precious indices.

II. THE EXISTENTIALIST WORLD

Contemporary existentialism is no more a complete novelty than is Marxism. It is, like the latter, a child of ancient atomism, and, in the manner of Socrates, invites man to know himself. It is " a reaction by a philosophy of man against the excesses

found in the philosophy of ideas, and in the philosophy of things." *

Curiously enough, contemporary existentialism, as well as Marxism, took its rise in the reaction of the Dane Kierkegaard, against the idealist determinism of Hegel. Marx, however, contradicted Hegel by professing collectivism and a materialistic determinism, while Kierkegaard remains an idealist, in this sense that he believes in God, and protests against determinism in the name of the personal liberty of man. French existentialism, and by this we understand that of Jean-Paul Sartre (for the Catholic, Gabriel Marcel, does not like to be labelled as an existentialist), is a direct descendant of Heidegger, who was himself a disciple of Husserl, and it is strictly atheistic, as was the thought of Heidegger.

Essentially concerned with man, existentialism gives a secondary place to the world, and considers it chiefly in its value for man.

A. The method of Sartre is that of Husserl, but transformed as to its implications.

Husserl (1859-1939) reflected deeply on the Cartesian "cogito," but, along with Kant, he could see no more than a phenomenal ego there, contrary to what Descartes himself had seen, namely, ego-substance. Husserl's "phenomenological" method consists in "describing phenomena such as they are presented, and the ego to whom they are presented." ** It demands "the bracketing" of every other certitude, except that of phenomena, and simply consists in their analysis.

But every phenomenon is the consciousness *of* something. The "cogito" is meaningless without a "cogitatum." Consciousness, wherein the ego is essentially "intentional," is directed towards some object. Here objects are reintroduced.

11 Translated quotation from E. Mounier, *Introduction aux Existentialismes*, p. 8. See Kurt F. Reinhardt, *The Existentialist Revolt* (New York: Ungar), pp. 1-24. An excellent background study.

** Quotation is translation from R. Verneaux, *Leçons sur l'Existentialisme*, p. 45. See also James Collins, *The Existentialists* (Chicago: Regnery), pp. 27-31.

but only as they are objects for me, or inasmuch as they are phenomena. "In perceiving them (things), I make them exist (for me), and I perceive them such as they exist (for me)." M

Therefore, this method leads to an absolute evidence. But it bears only on the pure ego and its pure objects, on "the pure flux of the lived," says Husserl. Philosophy ought to limit itself to describing this situation. It should "reveal" the data. It neither poses problems nor solves them. Its indefinite task is to explore that which is presented to consciousness (objects) and the consciousness which observes (the "intentions" or aims, the attitudes of the ego before objects). Only on this condition "will philosophy have the foundation of an exact science." "

Heidegger accepts the method, but gives it a *realist* implication. He sees this method revealing consciousness as a transcendental reality, and he so applies it in his work, *Being and Time*.

Sartre, likewise, in his work *Being and Nothingness*, follows the same basic method, as is indicated in the sub-title of his work, "An Essay on Phenomenological Ontology." He would like to realize the ambition of establishing a theory of being, which he feels has not been done satisfactorily by Heidegger.

B. Being-in-itself is the expression, which, in Sartre, designates the existent in its brute state, the datum such as it appears before consciousness, the world as unconscious and unformed.

1. Does *this term* contradict the explicit affirmation of the method that "only phenomena exist?" No. It certainly designates a *reality*, something which does not exist for me only (i.e., when I know it or desire it). Nevertheless, it does not signify a thing-in-itself, "a substance." It designates a phenomenon, or rather a *series* of phenomena, with nothing

* Quotations are translations from R. Verneaux, *op. cit.*, n. 50 See J. Collins, *op. cit.*, pp. 42-45.

« R. Verneaux, *op. cit.*, p. 46.

hidden behind them, without anything potential in them; yet, a series which in its multiple aspects goes beyond the experience which I have of any one or ones among them.

To speak of the *in-itself* is to speak of the existent before its appearance to the ego-subject, considered as confronting me, as transcending me. I am aware of it, yes; but I do not assimilate it. Thus, there is a phenomenon, which exists not only insofar as it appears, but which is the very foundation of its appearance to me, in a word, a phenomenon with a transphenomenal core.

2. *The characteristics of the in-itself* recall those of the being of Parmenides²⁴ (BN, Ixiv-lxix). It is that which is. The principle of identity is valid for it, whereas it is not valid for being-for-itself or consciousness (which is made from being and from nothing).

It is, therefore, uncreated. Creation is impossible. For, either created being would be immanent to God, and therefore not in itself, but in God; or it would be outside of God, and therefore in itself, and sufficient without God.

It is neither affirmable nor deniable, neither active nor passive, neither conscious nor immanent to consciousness. These notions suppose a consciousness which judges, or envisages an end, or knows itself; but being-in-itself supposes only itself. It is itself, nothing more and nothing less.

Therefore, it is opaque, massive, full, immobile, since it is simply itself. It is not deduced or capable of explanation, since ideas must be used in a deduction, and active beings must be implied in explaining things by ends or aims. It is. Therefore it is a *pure fact, absurd, contingent, superfluous*.

Such is his translation into ideas of the intuitive experience of disgust which the brute existence of things arouses in us.

*» J. P. Sartre. *Being and Nothingness*, trans. by Hazel E. Barnes (New York: Philosophical Library, 1956). It is this work that the initials BN refer to with page numbers as found there.

3. *Being-in-itself* exists also in man. It is facticity (that which has the characteristic of a pure and simple fact). It is encountered at four principal levels :

a. In *my body*, " a contingent form which the necessity of my contingency takes " (BN, 328). **

b. In *my past*, insofar as it has been separated from the region of my possibles. I can no longer change my past. " One, " *i.e.*, anyone, can write the history of it as of a thing, or define it. It has fallen back from the for-itself into the in-itself.

c. In *my situation*, opposed as it is to my liberty. My situation limits my possibilities. My first situation is the very fact of my liberty. I am condemned to be a free being.

d. In *my death* : it transforms my life into a thing. It is outside of my possibilities, and even destroys all of them. By his death man returns to the in-itself from whence he came, without any possible explanation.

C. The world is not being-in-itself; it is being-in-itself *insofar as* it is known or unveiled; it is the phenomenon of being-in-itself.

" Human reality makes a world exist... I am the being by which ' there is ' being. " (BN, 248, cf. 300-01). " *There is* being because the for-itself is such that it has being. The characteristic of phenomenon comes to being through the for-itself " (BN, 619).

Merleau-Ponty makes the following comment : " Scientific views according to which I am a moment of the world are always naive and hypocritical, because they must suppose, without mentioning it, this other view, that of consciousness, by which the world is first disposed around me and begins to exist for me. " 28

* This translation does not correspond with that of H. E. Barnes, but is thought to be more exact.

** A translated quotation from M. Merleau-Ponty. *Phénoménologie de la Perception*, p. ni.

Nevertheless, things are not in consciousness. Consciousness is transcended in attaining the world : " All that is intention in my present consciousness is directed towards the outside " (BN, liii-liv).

1. **THE FOR-ITSELF AND THE WORLD.** **How** do being and consciousness communicate? Such is the position of the problem (BN, Ixvi). We must at the same time avoid both realism and idealism. Sartre gives the following answer (BN, 617-618) : " The for-itself and the in-itself are reunited by a synthesizing liaison which is no more than the for-itself.... The for-itself appears as a small denial of being which takes its origin in the very bosom of being, and this denial of being is sufficient to cause a total upheaval in being-in-itself. This upheaval is the world " (BN, 617-618).

" *Why* does the for-itself take its rise from being? " (BN 619).... " Questions on the origin of being, or the origin of the world, are devoid of sense when they receive an answer that poses as an ontological one, " i.e., in the for-itself (for the *why* supposes consciousness).

Metaphysics must decide which of these two solutions is preferable: (1) phenomenon is unique, it is the world; it has two aspects of being : the in-itself and the for-itself; (2) phenomenon is twofold : consciousness and being; a metaphysics of nature could be attempted from the action which joins these two planes. It is not " being and nothing " which attempts to solve the problem (see BN, 625).

2. " These " or individualities.

" How can the rising of the for-itself to being, fashion a *whole* and *these*.³ " (BN, 181). There is a whole, because there is a *whole* which I am not, from which I separate myself : " thus knowledge is *the world* " (BN, 182). And the being *which I am* not now, insofar as it appears against the totality of being, is *the this* (BN, 182-183).

Thus the world vanishes as a totality into a simple collection of " these " : it is therefore *space* : " Space is neither the background nor the form, but an abstractive background, insofar as

it is always able to be separated into forms; it is neither continuous, nor discontinuous, but a permanent passage from continuous to discontinuous " (BN, 184). As far as localization is concerned, it is only a name : " (Spatial) determination is a *nothing* which belongs neither to a thing nor to consciousness by any title of internal structure, whose only reality is to be named " (BN, 186).

3. the cleavage (between this and that) "comes from being (curious... because we have said that it is full and undifferentiated), but *there is no* cleavage nor separation except by reason of the presence in all being of the for-itself'.... "Quantity... is pure exteriority. It depends in no way on the adding of terms, and is only the affirmation of their independence " (BN, 190).

the categories "only indicate the infinite diversity of the ways in which the liberty of the for-itself can realize the indifference of being " (BN, 192).

Permanence, potentialities, probabilities, essences, are so many unveilings of being as *thing*, simply by the presence of the for-itself.

" And the thing, insofar as it is itself, and at the same time the indication of tasks to be accomplished... is an instrument or *utensil*...." "The original relation of things among themselves... is, therefore, the relation of being used." The scientist tends to reduce it to completely external relations (BN, 201).

4. the sense of the world : " The totality of utensils is the exact correlative of my possibilities. And since I *am* my possibilities, the order of utensils in the world is an image of my possibilities projected into the in-itself, that is, a projection of what I am. But I can never decipher this image of the world. I adapt myself to it in and through action " (BN, 200).

We " run after a possible which our very running makes appear, which is nothing more than our running, and which is thus defined as being beyond reach. We run towards ourselves.

and we are, by this fact, a being which is not able to catch itself. In one sense this course is meaningless, for its term is never given... And in another sense we can not refuse it this meaning which it rejects, since, despite all, the possible is the sense of the for-itself " (BN, 202).

5. the time of the world. " A universal time comes into the world by reason of the for-itself " (BN, 201). How? " It is in time that my possibles appear at the horizon of the world, which possibles make my world " (BN, 105).

Time is not a Kantian *a priori* form. " The ' this ' is unveiled in a temporal fashion not because it is refracted through an *a priori* form, but because it is unveiled by an unveiling whose very being is temporalization " (BN, 205), i.e., by an act of knowledge which is essentially temporal. In this sense, the time of the for-itself is projected into the in-itself, and constitutes the time of the world.

6. substantial changes. That which comes to be in the appearance of this or in its disappearance is something of which we are ignorant. We only know that something has happened (BN, 206-207).

" The quasi-before of an appearance, and the quasi-after of a disappearance, can find no place in the fullness of being. It is only... against the background of the world that a this which was not..., can appear, through a for-itself." How? " We grasp the this, which has appeared as being already in the world, as its own absence, insofar as we ourselves are present to the world from which it is absent " (BN, 207).

7. laws of nature : they too are dependent on my liberty, which is thus chained to a determinism which it has created.

" Between brute existents there can be no relation. It is liberty which lays the basis of relations by grouping existents into utensil-complexes, and it is liberty which projects the reason of these relations, i.e., their end. It is precisely because I project myself towards an end through a world of *relations*

that I meet sequences, linked series and complexes, and I must determine myself to act according to these laws " (BN, 551).

Thus the world appears to me, both in perception, and even in science, in the measure that, tending towards ends, I endow the in-itself with determined characteristics, which are either hostile or favorable to my project, beyond which my liberty can not go.

D. Observations

1. THE PHENOMENOLOGICAL METHOD, which is idealist in its origin in the pure *Cogito*, and still idealist in its term with Husserl, in the hands of Sartre is an attempt to bypass both realism and idealism together, an attempt to reach transphenomenal being. This, however, is impossible. Etienne Gilson states with the authority of a historian : " We can begin with Descartes, but we can finish only with Berkeley or Kant. " 27 From a being given in a perception, one can draw only the existence of the perceived, and never the existence of something other than the perceiver.

Sartre discovers the /nw»sphenomenal, the /rawscendent, i.e., the in-itself and the immanent, which is the pre-reflexive *cogito* (the existing subject, before consciousness reflects on itself); but what can he say of one or the other, except that one is not the other, except that one is correlative to the other? Where does he see in this a progress beyond Kant? The in-itself is unknowable, and consequently, so is the for-itself as an existing thing. Doesn't Sartre acknowledge this? " Actually, the *self* can not be grasped as real existence... The self represents... a way of not being its own coincidence" (BN, 76-77).

Instead of a going beyond Kant, is this not rather a going back to the phenomenalism of Hume? " Appearance does not refer to being as a Kantian phenomenon refers to a noumenon. Since there is nothing hidden behind it, and since it refers only

27 E. Gilson, *Le Réalisme Méthodique*, p. 5.

to itself (and the total series of appearances), it cannot be supported by a being other than itself" (BN, 1-li). Isn't this the same as saying that the phenomenon, the appearance, is being itself, and the only being? And when we say that an appearance indicates only itself, how can we add "and the total series of appearances" without contradicting what was just said? To avoid a contradiction, we must suppose an internal unity of phenomena, which has traditionally been called substance, essence or nature.

Sartre, then, does not seem to be able to escape from the idealist phenomenism, which he condemns, and it appears that he is driven to say with it by his very method: "Nothing exists except conscious appearances."

Must we not, at least, expect omissions and negations in a philosophy which makes the pretention of attaining being through a method, which at the very least, makes abstraction of it. It would be useful here to read the remark of Brunschvicg: "It is not certain, in any case, it is not demonstrable, that what is neglected by the very nature of a method should actually be negligible."M

2. the **BEING-IN-ITSELF** of Sartre does not have the characteristics of a veritable being.

"A phenomenal existent can never be derived from another existent, considered simply as existent," nor from a possible, for "the possible is a structure of the for-itself; ..it belongs to another region of being. Being-in-itself is neither possible, nor impossible, it *is*" (BN, Ixviii).

We may object to the above by posing two alternatives. Either this statement means to say that in every consciousness, in all knowledge, there is an existent thing whose mystery goes beyond us and remains impenetrable for us, i.e., inexpressible in attributes which are known to us. This is true, but by speaking of it in the terms of the Sartrean in-itself, one utters a paradox which creates a monumental error in the mind of the

*Translated quotation from L. Brunschvicg, *Introduction à la Philosophie de VEsprit*.

reader. By what right is being-in-itself constituted by these negations, which can only designate it by what is inaccessible for us? The for-itself is not the measure of being. Since it is, the in-itself cannot fail to be its own essence, to have its sufficient reason, its mode of activity; otherwise, it would be nothing at all.

Or the above statement of Sartre means to say that the in-itself is a being constituted simply and purely by the aforesaid characteristics. It is, in-itself, and excludes every other qualification. Such a being is nothing more than an abstraction. To call it the existent is to make it absurd and incomprehensible. It lacks the stuff of being, because it is undetermined. It is in-itself, but this self is not different from another individualized being. It has the air of a Platonic idea fallen to the level of unformed matter. It is said to be contingent, superfluous: this is only too true. Therefore one suppresses it, instead of investigating it completely. And if it is imposed as a datum of consciousness, can consciousness dispense itself from holding that it is thinkable, even while it is thinking about it? Whatever consciousness applies itself to think about is to that degree thinkable.

Actually Sartre is here reviving the argument of Parmenides, when he treats the abstract idea of being as if it were an intuition of the existent. He further aggravates the problem by excluding the true Being, who is God, on behalf of a bastard being which ought to be God, since it can not be created and suffices in itself, yet which can not be God, since God is decreed impossible, and the in-itself forbids all consciousness of self. Finally, the in-itself appears as simply being matter, such as the materialist dialectic of Marxism understands it — a place of hidden contradictions and the foundation of consciousness.*

Moreover, Sartre opposes the in-itself and the for-itself to the extent that he deems their fusion in an in-itself-for-itself impossible, a fusion which would suppose an idea of God, a fusion to which, according to Sartre, human liberty aspires.

* Gabriel Marcel, marks this latent materialism in Sartre in *The Philosophy of Existence*, Eng. trans. Manya Harari (New York: Philosophical Library, X949), "Essay on Existence and Human Freedom," p. 65.

But on what grounds does he so oppose them? If the in-itself is only an unknown for Sartre, how does he so clearly see in it the impossibility of it being united to a for-itself? If the in-itself is absurd, pure contingency, why refuse its being absurd in another manner, i.e., having consciousness of itself? Could it not be that the contingent fusion (in the Sartrean sense, i.e., independent of human liberty) of the contingent in-itself and of contingent consciousness would be far less absurd than their separation? The idea of God has never been the clearest in the world; nevertheless, it clarifies that which without it would be absurd.

As for the rest, the play of logic in Sartre's demonstration is an obvious sophism. The in-itself is treated as a mathematical definition, although it must be taken to signify the fundamental existent. A mathematical definition expresses the very essence of its subject. A triangle is a triangle; it is nothing else, neither red, nor sugared. By what right, then, does Sartre treat an existent as if it were a pure essence closed in on itself. One of the strongest assertions is that existence can not be reduced to essence. This is a very basic truth, so why deny it? If the in-itself is treated as an existent, one can not refuse its having concrete attributes, nor can one reason from what the in-itself is to the denial of the attributes of the for-itself. An existing triangle can be red, cold, sugared, made out of paper or of earth, the hat of a gendarme, or a pediment. Could not the in-itself be also the for-itself, thinking, willing, acting, and perhaps even creating? W. James ridiculed this in what he called vicious intellectualism : to satisfy this tendency, the king of England must be three persons : one governing the kingdom, another loving his wife, and the third one looked at by the cat of whom the proverb speaks : Even a cat may look at a king... *

3. THE WORLD FOR ME

a. It is true that the existence of my liberty confers a sense on the world, and even its meaning.

*cc G. Picard, " L'Existentialisme de J. P. Sartre. " in *Mflanges dr Science Religieuse* (1946), p. 332.

b. That the existence of my liberty gives to the world its structure, the distinction between its individual beings, the multiplicity of its kinds, the temporal succession of its changes, and the determinism of its laws, is a paradox which offends common sense, and is nothing more than a revival of idealistic relativism. There is certainly an element of truth in these ideas. If one wishes to say that my consciousness discovers the world under such and such aspects by reason of varying interests, varying human aims, and by that liberty which is constitutive of human comportment, he is right. But discovering is not creating. Does the in-itself of the world have an internal structure, a multiplicity, a course, a determinism? If so, why seem to deny it? If not, no science is true, no truth about the world is accessible to man.

c. What, then, is the reality of those characteristics under which the world appears to me?

Are these characteristics those of the in-itself, only as they are unveiled? Then I am cause only of the unveiling of the world, and it is false to write : " human reality makes the world exist " (BN, 248).

Are these characteristics only a projection of my aims on the in-itself? Then, as R. Vemeaux judges it : " Existentialism... holds a position very similar to that of Kant. It professes... a sort of masked idealism.... The two planes, ideal and real, are heterogenous and without any possible communication. " **

Are these characteristics an ensemble of those of the in-itself and those of my instinctive and free attention given to being? Then they could be explained by an interdependence, a narrow union between the for-itself and the in-itself, as expressed by the Thomistic theory of abstraction. The universality of these characteristics is the work of reason, but these characteristics reflect a structure in things, which is capable of universalization, because it concretizes a divine idea. Therefore the world is truly *that which* we know about it; but it does not exist in

*» R. Verneaux, *Leçons sur VExistentialisme*, p. 183. See also J. Collins, *The Existentialists*, p. 52.

the way that we think and speak about it. The world is also that which we do not know but which, nevertheless, interests us, without having to make of that knowledge a mere collection of "utensils." The taste for knowledge is not sated simply by practical aims.

4. Finally, we can see in *Being and Nothingness* a description of certain attitudes of consciousness in relation to being,⁹² which have no small merit in psychology.

The danger lies in taking these descriptions as solutions, as we are invited to do in the problem as posed in *Being and Nothingness*. The hasty reader is especially exposed to this danger, and above all, in the literary works of Sartre.

The insufficiency of the phenomenological method to resolve the problem of being seems, in any case, to be clearly enough demonstrated by the trial which Sartre has attempted. He places the absurd as his starting point, in the in-itself; he places it again at the term, in the for-itself, which ends up being as superfluous as the in-itself.

The existentialism of Sartre can thus be evaluated as a demonstration "per absurdum" (as the logicians say) :

a. of the existence of God, which must necessarily be admitted to assure the intelligibility of the world and the soundness of reason ;

b. of a metaphysics of abstraction, which is necessary to the truth of science.

⁹² See John Wild, *The Challenge of Existentialism* (Bloomington: Indiana U. P., 1955). PP- 236-240.

II

PHILOSOPHICAL
PSYCHOLOGY

INTRODUCTION

A. The problem. Philosophical psychology is the metaphysical study of living things and especially man.¹

Empirically, man attaches the events, which he witnesses within himself, to an internal principle of life, which he calls his soul (psykhe); he judges other men to be as he is; he even willingly concedes a kind of inferior soul to animals, especially those whose fidelity he appreciates or whose enterprise he admires.

The objective, universal and methodical curiosity of the *scientist* is concerned with discerning and describing the phenomena of life and with the discovery of its laws. In doing this, he observes the similarities which unite all living things, as well as the differences which separate and hierarchize them. Side by side with disciplines dedicated to the study of the most general characteristics of living things are biology, biochemistry, genetics, and those which describe species: morphology and physiology, wherein living things are classified. Systematic psychology, which has as its task the study of the facts of sensation, movement or action, emotion, and more generally, the phenomena of consciousness, falls into various classifications. This science is naturally divided into animal psychology and human psychology. However, the first can utilize only the

¹ The word is used by Aristotle to designate a soul as the first principle of life in organisms. His *Ilepi vu/fc* is the first treatise of psychology. His point of view is both biological and philosophical, and it covers every level of life from plant to man.

Among the modems, psychology is ordinarily limited to the study of organisms which are endowed with consciousness. Limited to the study of man by the Cartesians, psychology has since regained its right to investigate animal life, which we must recognize as being guided by at least a rudimentary knowledge.

objective method, the observation of behavior, whereas the second rests largely on the subjective method, which involves introspection. Both have the common ambition of explaining vital phenomena by their laws, i.e., by the constant links among themselves or with other phenomena.]*

But even if we were to suppose that the ambitions of both these psychologies could be completely realized, another type of curiosity would remain unsatisfied, namely a *metaphysical* one. Phenomena appear to us as linked in another way than by laws. They take place in animals and men, whose life they constitute. They are linked to *subjects*, to *substances*. How are psychological facts organized, not only for the consciousnesses which experience them, but in their *living reality*? They are real, but from what does their reality arise? They are changing, and regularly enough to be able to be expressed in laws, yet how are their mobility and stability to be reconciled? They are multiple and successive in the same individual, yet how explain the unity and identity which group them in so many distinct individuals? In short, scientific curiosity is turned towards the "appearing," while metaphysical curiosity is turned towards the "being" and towards the three principal questions relative to the "being" of living things: (a) What is a conscious being? (b) What is *its cause*? (c) What is *its destiny*?

However, metaphysical psychology' is principally interested in the study of man, which is evidenced by the methodic concern it takes in building on man's experience, although like all sciences it must simplify' by categories. Actually, an animal, as a conscious being, is knowable to us only' by its analogy with man,' and since man is an animal by his sensations, his movements and emotions, to know him is to know animal life

* Science, in particular, is forced to explain psychological events by physiological ones (nervous, muscular, and secreting activities) or even physical ones (such as excitants and sensory stimuli).

• An analogy which should neither be forced nor excluded. Moreover, it has less force, the more the animal type is removed from the human type. Man can conjecture up to a certain point on the soul of a dog, a horse or a cat ... and more generally about mammals, but what does he know about the passions of a starfish?

in the measure which is permitted us. The problem posed in metaphysical psychology is threefold : (1) man's nature. (2) HIS ORIGIN. (3) HIS DESTINY.

B. Distinct from empirical psychology by its theoretical and objective aims, from scientific psychology by its orientation towards being itself, metaphysical psychology is also distinct from all other philosophical disciplines which pertain to man. Actually, *logic*, *ethics* and *aesthetics* study the interior acts of man and their external results from the point of view of their value, and not from the point of view of their proper reality. They are critiques, not metaphysics.

C. Method. The method of such a psychology will, therefore, be essentially metaphysical.

Its starting point ought to embrace an immediate grasp of real existence, i.e., an experience which bears on being. Without such a grasp, reality could never be attained, since reason can only explain what the initial datum contains in a confused state. This grasp of existence, however, will be a starting point, only if reason discovers in this existence a need which provokes it to further research, i.e., an incomplete intelligibility, which needs something else to explain it.⁴

The method will, therefore, consist in asserting those attributes which are drawn from an explicative principle, which render it apt for explaining vital phenomena. That method is : *operatio sequitur esse*, operation proceeds from the nature of the existent.

Thus, we begin with psychological phenomena, already grasped by common sense and described by the ordinary words of language. Then we observe the classifications and explanations of the scientist. However, we begin with these by

⁴ Thus the flight of time empties me of life, and assails my desire for permanence by presenting to me the anticipated image of my death. It makes me feel a void in my knowledge by showing me a present which comes from a future which was not, and which falls back into a past which no longer is.

realizing from the lieginning that they are insufficient in being, insofar as they are phenomena. The initial question then is this : Is man only an illusory unity and actually a mere succession of conscious states? If, on the contrary, there is a real link between these states of his consciousness, what could this identical and active unity be?

D. Solutions. From antiquity, common sense has furnished a solution to this problem, which psychological science obliges reason to pose, an answer so generally accepted that even the pygmies admit it.⁶ Man is a composite of visible and invisible, of body and soul, of matter and spirit.

1. this dualist solution has not been disdained by the spiritualist philosophers, but they have been aware of its difficulties and its limits. The principal obscurity in this position is the nature of the union of body and soul.

a. *Plato* (428-347 B.C.) has compared this union to that which exists between a rider and a horse. Following the same tendency, *Descartes* (1596-1650) saw in man a purely thinking soul, dwelling in a purely passive extension which was only apt for receiving local movement from the outside. In such a perspective, knowledge is, above all, a *contemplation of ideas*, principally or totally *innate*.

b. *Aristotle* (384-321 B.C.) saw in the union of the body and soul an instance of the union of prime matter and substantial form. Following this direction, *St. Thomas* (1225-1274) set himself to safeguarding the spirituality of the human soul and consequently its personal character, which confers on the soul a value, which is not only that of a representative of species, but of individuality as well. In such a conception, intellectual knowledge is, above all, an *active abstraction* grasping the universal in the sensible.

2. Other philosophers, recoiling before the difficulties of a dualist approach, have adopted one of two most solutions.

* A. Le Roy, *The Religion of the Primitives*, Eng. trans. Newton Thompson (New York : Macmillan, 1922), pp. 91-113.

a. For *materialism*, the soul is of the same nature as the body. This was the thought of Democritus (5th cent. B.C.), who was followed by Epicurus (4th and 3rd cent. B.C.) and Lucretius (1st cent. B.C.), who held that the soul is formed of atoms. The same rejection of spirit is still found among the Encyclopedists of the 18th century, La Mettrie, for whom man is pure machine, and d'Holbach, for whom sensation is a product of movements in the brain. A goodly number of German biologists in the 19th century held similar opinions : Vogt and Büchner stated that thought was constituted by certain material movements or by a kind of cerebral secretion. It is Le Dantec (1869-1917) who formulates the extreme of materialism, by endowing all matter with the property of thought, consciousness being for him no more than an " epiphenomenon " of matter.

b. *Idealism*, on the other hand, absorbs matter into spirit. The only reality is thought and its object, which is drawn from thought and remains " immanent " to it. Berkeley (18th century)» Fichte, Schelling and Hegel (19th century), Lachelier (19th century), Hamelin and Brunschvicg, whose theories are different enough, remain the principal representatives of idealistic monism.

3. Finally, Kant and his school of criticism have opposed a demurrer to our metaphysical problem. They believe themselves to have demonstrated there can be no theoretical certitude about " things-in-themselves. " They, however, leave place for practical beliefs about the soul, its immortality and its liberty, but refuse to recognize in them the value of truths.

E. The importance of the metaphysical problem of man, however, will oblige every man who thinks, to pose the problem for himself, and to resolve it with the unflagging hope of finding a true solution to it, even though it may be incomplete. Its importance is linked to :

1. the situation of man in the hierarchy of beings: a microcosm of the material world by his body, man is, by the

knowledge which he has of it, the beginning of a spiritual world. To know man is to know the two worlds at the point where they flow together.

2. the relations which the psychological problem has to other disciplines:

a. This problem of the nature and ends of man rises spontaneously from the psychological law's of association, memory, will, the ego, and from the general law' of reciprocal conditioning pointed out in physiology and psychology. The *scientific-psychologist* tends naturally to become a philosophical psychologist.

b. The *moralist* needs to know' the nature and destiny of man so that he can justify the natural moral law rationally, and determine the principal exigencies of it.

c. The *general critique of* knowledge can be established and based only on a metaphysical analysis of the real conditions of knowledge.

d. *Natural theology* finds in man himself a privileged way to God. It is not limited to seeing in man just a proof that God exists, for it can go even further, and, through a remote analogy with the human mind, it knows that which is the life of the Divine Spirit.

e. *Revealed theology*, in order to express the profound mysteries of the Trinity, of the Incarnation, of Grace, of the Church,... of the Sacraments, of Heaven, Hell and Purgatory. . . ; in order to furnish some analogies of these mysteries; in order to deepen its study by the light of reason, can not dispense itself from exploring the metaphysical structure and essential orientation of man.

BOOK ONE

THE NATURE OF MAN

Of what are we going to treat? Of man, i.e., of we, and of all those who are able to think of themselves as me.

This "me," such as consciousness is aware of it, is the starting point of metaphysical psychology, its experimental datum, which we will attempt to understand. This "me" appears as a synthesis of events: (1) a synthesis *relative to an "I,"* which is one, identical and active; (2) events stemming from this "I" as *acts* which modify it by enriching it; (3) acts which are *multiple and relative to objects*, as they tend towards them and *attain them in diverse ways.*¹

There are, therefore, three aspects, at least, which we must study in order to determine the nature of the me:

- 1) *the enduring unity* of the "I" in its change,
- 2) *the internal activity*, which produces psychological becoming,
- 3) *the individual multiplicity* and the *specific diversity* of psychological events.

The natural order of metaphysical research is to begin with that which is clearest to experience and simplest in relation to thought, and it finishes with that which was at the outset most complex and most obscure: substance in its concrete reality. We shall, therefore, study:

Chapter I. Psychological Phenomena: Their Distinction.

Chapter II. Operative Powers: Their Activation.

Chapter III. The Substantial Unity of Man: The Rational Soul.

¹ See E. Baudin, *Psychologie*, p. 17, and Chapter vii.

CHAPTER I

PSYCHOLOGICAL PHENOMENA :
THEIR DISTINCTION

First Question : *are* psychological phenomena?

First Thesis : Psychological phenomena are :

1. *Motions*
2. which in themselves are merely qualitative,
3. but nevertheless united in a reciprocal dependence to corporeal movements;
4. they are immanent acts,
5. and yet essentially relative to objects.

A. Notion and problem. The phenomena with which psychology concerns itself are those which experience attains originally in consciousness. This mixed experience is outlined, in *every man*, in a partial way. It is expressed in language, but in this way it is mixed with experiences of another kind. I live, I breathe, I sleep, I walk; I wish, I see, I understand, I think. In this “mine” which I attribute to myself, all is not psychological. The psychological I attribute to myself as that which makes me know myself. To live, to breathe, to sleep, to walk, are not psychological facts. I can understand them as belonging to some one other than myself, by my experience with the external world. However, I predicate them of a subject which lives them, and I speak of them with the very same formulas that I would use if they were psychological.

Scientific research, therefore, had to specify the extension of its object. It opposed the psychological to the physiological

and the physical, *and it even further distinguished the psychological into conscious and subconscious.' Yet it also recognized the close relations existing between these differing domains. Psychological events are conditioned by physiological ones, especially by events involving the nervous system, and even those which pertain to the purely physical world.* As to subconscious events, they are not of another nature than conscious events, and normally they form together the course of individual life.⁴

The first task of the *philosopher* is to inform himself about the empirical and scientific data of psychology in as complete a way as possible, to help him go beyond these data and grasp the essence of the ego itself.

The empiricists believed that they had arrived at this goal, when they had reached the maximum breaking down of phenomena, after they had previously succeeded in isolating one phenomenon from another. This analysis, they thought, ought to furnish them with the *elements* of the ego, after which the ego would be defined as a grouping of homogeneous states realized according to certain laws. This was done in the same way that a chemical substance is defined by its component atoms, assembled according to numerical laws. Thus they have reduced the ego to nothing more than a name, labeling multiple phenomena which are added up to a fictitious whole. •

The rationalists are forced to maintain the unity of the ego. They have affirmed its substantiality. Often, however, they have pictured this ego in an impassible attitude, isolated from its phenomena which flow around it and move incessantly before its immobile gaze. The ego becomes an undetermined receptacle for all phenomena, to the extent that there is in it

* *Brett's History of Psychology*, pp. 584-656.

* *Ibid.*, pp. 684-688.

⁴ G. Klurertanz, S.J., *The Philosophy of Human Nature* (New York : Appleton, 1953), pp. 21-29.

⁴ James F. Barrett, *This Creature Man* (Milwaukee : Bruce, 1937), p. 62.

* See James E. Royce, S.J., *Man and His Nature* (New York : McGraw-Hill, 196X), pp. 311-312.

a place "for all of humanity, or for God, or for existence in general." ⁷ Therefore, the ego no longer belongs to any person in particular, it tends to engulf everything, as happens in the doctrine of the pantheistic post-Kantians.

Bergson has attached these two extreme doctrines to a similar conception, that of conceiving phenomena as parts of the ego, distinct among themselves in the manner of extended parts, the objects of external perception. He protested vigorously against this breaking down of the ego into a multiplicity of states, which were homogeneous among themselves, and each living for itself. This method, according to him, shows a result of the natural tendency to *symbolize* quality by quantity, duration by space, and heterogeneity by homogeneity, and consequently the natural tendency to *conjure* the symbol with the thing. Because of this likening of the ego to an indefinitely divisible space, Bergson rejects the value of this method for knowing the real nature of the ego, which, according to him, is the proper task of the philosopher. At the most, this method can furnish lifeless sketches, which are approximative and highly incomplete despite their multiplicity. They can be useful sketches for those who wish to speak of the ego, or to act on it, but they are insufficient to reveal it. "Science substitutes for the ego a series of elements which are psychological facts." ⁸ The philosopher ought to place himself at the very heart of his object and attain it *in an intuition*, which is beyond language and scientific formulas. "We use intuition, here, as *sympathy* by which one transports oneself into the interior of an object to identify oneself with that which is unique and consequently unexpressable." • And further: "The simple act, which gets analysis under way and which is concealed behind analysis, emanates from a faculty completely other than that of analysis. This will be, by very definition, intuition." ¹⁰

We can not fail to recognize the cogency of Bergson's criticisms. Nothing is more harmful in psychology than the

* Bergson, *La Pensée et le Mouvant*, p. 221.

* *Ibid.*, p. 215.

* *Ibid.*, p. 205.

1,1 *Ibid.*, p. 253.

forgetting of the experimental data grasped in the intuition of consciousness. No danger is graver, here, than that of treating a phenomenon, either as a small ego within a greater ego, or as an integral ego by making it either a part or a whole. This danger occurs because of our tendency to imagine everything and to localize it, and thus to transform everything into extension. Actually, phenomenon is the ego incompletely grasped, already known but still unknown. The experimental datum is that of an ego which is unique and multiple by reason of the multiplicity of its revelations to consciousness. This multiplicity, however, is completely other than that of number or of extension. In extension, every unit is a part, the multiplicity is a mutual exteriority of units. The parts or units are completely homogeneous one with the other and each of them with the whole. The situation is completely different in the ego. Undoubtedly there is a multiplicity of phenomena, but the phenomena are not exterior one to the other, nor homogeneous among themselves, nor consequently to the ego, which they form, but which is not their total.

Keeping constantly before our eyes the relation of psychological phenomena to a single ego, let us seek to discover and express, despite the limitations of language, *what they are*.

B. They are movements. In other words, we experience the ego only in experiencing its change, its becoming, its progress. All that is the object of psychological experience (phenomenon) is movement.

1. *Let us start now with phenomena.* Isn't sensing, desiring, willing, a change? Isn't it experiencing something new in ourselves, something lived for the first time? You may ask, how is seeing this desk at which I am writing, and where I have worked for so many hours in the past, something new? I agree that *the desk* is old, and *the possibility of seeing it* is old, but *the actual fact of seeing* this desk now is a unique moment in my life, which I have never experienced before and will never experience again.

Without any doubt I have experienced *other visual perceptions* relative to this same desk, but they were *other* than my

present perception. That these perceptions resemble each other, I will agree; but that they are identical and absolutely homogeneous, I deny. Past perceptions are no more than a memory, to which my present perception can in no way be reduced. Every phenomenon is therefore a unique moment in a unique movement, that of the ego.

2. *Let us, now, turn to the ego.* Isn't it the very contrary of movement, since it is one, identical, active, whereas movement is multiple, diverse, and the effect of an activity? We must now become more precise.

a. Movement is multiple in this sense, that it connects the "one" to the "other." It is essentially a "becoming other," — "*fieri aliud*" — and, at every moment, it is such that it can never coincide with absolute unity. It is, however, a relative unity, a unity in which the heterogeneous moments, which make it up, have their foundation in a unity having no definite limits which close these moments in on themselves. It is the unity of their succession, of their continuity, of their direction.

Now what is the *unity of the ego*? As it is grasped in consciousness, it is relative to phenomena. It is impossible to think of the ego not having a relation to them. The unity of the ego is not, then, an absolute unity. It is the unity of the movement of phenomena, the unity of their succession, their continuity and their direction.

b. Is movement diverse? Yes it is, and diverse in several ways : by the distinction of spatial positions, if it is displacement ; by varying intensities and the heterogeneous qualities of its moments, if it is alteration — as is the case of consciousness. However, this diversity should not make us forget the community of existence of these different moments within an undivided movement. It is one and the same movement which diversifies itself in a certain manner. Abstract diversity is opposed to identity. Yet the diversity of movement supposes its identity throughout the duration of the movement. Suppress that identity, and you no longer have movement, but only a confusion of positions or of successive states.

What exactly makes up the *identity of the ego*? The ego, as it is related to phenomena, does not suppress their distinctness, their heterogeneity. It even exacts it! In order that this identity exist, it must have diverse phenomena. The identity of the ego, as revealed through introspection, is the individual identity of a current of phenomena in all the qualitatively distinct moments of its duration.

c. Is movement caused? Without any doubt it is, and even in a very special way. In general, that which depends on another thing for its existence is caused. Movement is caused in its own way : each of its moments is caused by others, and each moment causes another or several others — the sole exception being the first and the last of these moments. All of its moments are interdependent : the previous moment involves the existence of the following one; at the same time, the previous moment depends on the following, being constituted by its tendency towards it, by its progress in that direction. In this sense, movement is essentially caused, precisely because it is multiple and diverse in its manner. There will assuredly be more to examine as regards the question of whether or not we can find a sufficient cause in the complexity of its moments. It will be sufficient, for the time being, to note that movement is simultaneously caused and cause, that it causes itself.

What precisely is the *activity of the ego* as recognized in consciousness? It is precisely the influence of past phenomena exercised on present phenomena. It is the inclination to defer the present to the future in the acts of attention and of desire, and especially in decisions, which are the clearest examples of the activity of the ego. Now, if this present is *caused* by the past, and this other present is *caused* by the future, would they not make the ego of the same order as the past and future which cause them? On the contrary, these " presents " are the ego at its fullest consciousness, in its most immediate reality. As a matter of fact, it is the reality of the ego which reveals to me the reality of the past ego and of the future ego. Thus, I am not pure activity. I am also passivity and this even in regard to myself. If it is of the essence of movement to be in some way

the "cause" of itself, nothing prohibits the ego from being a movement. It is just that, since it is I who modify myself, I who change myself, in a word, I who live.

This may appear outrageous, and you may say that it is absurd to suppose that a being is modified by itself, that it gives to itself what it does not have.

Yes, it is absurd to think that a being should be what *it is not*, but it is not absurd to think that it acquires what it *does not have*. Is there no other way of acquiring except by receiving? How about producing? I see no absurdity there. You may press me further as to the reason of this producing, and you will have a point, and I will search for that reason in its time and place. But, let me here state as a fact: I am a becoming in movement. Psychological phenomena are movements, or better still, discernible moments of a unique movement which I call "me."

This doctrine is not so new that it cannot be found in St. Thomas. He affirms in the *Summa Theologica*,¹¹ that the soul knows itself not by grasping its proper essence in an intuition, but by knowing its "acts", i.e., the determinations which it gives itself and which really modify it (this is the general role of accidents in relation to substance). Thus experience reveals the soul and man as incessantly modified by the play of psychological spontaneities. As by a transcendent dissection going on in the lived experience of the ego, reflection, and reflection alone, will permit us to isolate the very substance of man, and, in that notion, the soul itself.

Corollary. We must distrust the expression, states of consciousness. At no moment is consciousness stationary. Even when I think of the same thing, I think of it differently from moment to moment. Attention does not endure except by constantly renewing itself.

¹¹ "Quia connaturale est intellectui nostro secundum statum praesentis vitae, quod ad materialia et sensibilia respiciat.... consequens est, ut sic seipsum intelligat intellectus noster, secundum quod fit actu per species a sensibilibus abstractas...; non ergo per essentiam suam, sed per actum suum se cognoscit intellectus noster." *S. Th.*, I^a pars., q. 87, a. i.

C. The qualitative nature of psychological movements has been misunderstood from antiquity.

1. MATERIALISTIC MECHANISM

a. *Its thesis.* Democritus and his disciples saw in psychological movements simple displacements and meetings of atoms. Materialism reduced them to a fatal mechanism, whose only originality was an extreme complexity. The ego is, therefore, only a result, an "epiphenomenon", i.e., a phenomenon which is a pure effect of a series, and therefore has no influence on this series or any other.

b. *Its general reasons.* The great argument is found in the experience which everyone has of the dependence of the "moral" on the "physical." Science has only reinforced this argument by its methodical and extensive observations. In particular, it points out the influence exerted on the feelings by internal secretions and by all the causes modifying the Ph (acidity) of the blood. It stresses the influence of the state of the nervous system on sensations, on memories and thoughts, by accenting the conditions of nerve activity (the dimensions of the cerebral cortex's surface, blood nourishment, toxins and poisons, excitants, etc.). "

c. *Its arguments* 1) The materialist gains an easy triumph : every psychological phenomenon depends on the movements of extension, and, therefore, he says, it is only a composite of these movements, quantitative and corporeal as they are, which are its parts.

This reasoning is a pure sophism, which postulates what it pretends to prove. Granted that psychological dependence on the physiological is a fact (as well as the inverse dependence of the physiological on the psychological, see D); but is there no

» C. Angras », *Cours de Philosophie*, Introduction, p. 23, (Editions Sociales) shows that Marxist materialism bases itself simply on the essential materialism that is found in contemporary scientific arguments.

other kind of dependence except that of the whole on its parts? The materialist forgets this preliminary question in his efforts to achieve a "coup d'état. "

2) Pose this question to him : he will answer that all reality must be explained by numerical laws. He will say that you deny to science the very means of existing, when you refuse to admit its methods of measure as having any validity for psychological facts. Admit then, he will say, that every fact is made up of enumerable parts; otherwise, you destroy science.

This is a conception of science which was in vogue for some fifty years, but it has gone out of date, and justly so. (1) It is nothing more than an "a priori " generalization of a method, which, assuredly, has proven itself in the physical sciences, but whose extension to the psychical world is completely arbitrary. (2) Moreover, even in that which concerns bodies, this method of measure has to bend itself, in order to be applicable to electronic phenomena and to vital phenomena as well. In these domains, measure does not express the laws of composition as they apply to an individual, but the laws of statistics and probability only as they apply to multitudes. (3) Very many see in number and the relations of measure a completely symbolic knowledge of things, which must be carefully guarded against, lest the symbol become confused with the reality symbolized.

3) The materialist presses on : I know only extension and its movements.... When I search the real for quality, I find nothing there, except its quantitative characteristics. The qualitative is unthinkable, and therefore not real. Psychological phenomena are either quantitative, or they are not real.

The materialist deceives himself. Far from knowing extension by itself, he can not sense it or think it, except by reason of its determinations. Could he see a surface, if it were not colored by the intervention of light? Would he be able to measure it, if it were not presented to him with limits which his notion of pure extension does not allow him? That which is knowable is the determined, the qualitative. Undoubtedly the most commonly known object in our experience is determined extension, but since the reason of its knowability is its determined

state and not its extensive character, we must conclude that the purely qualitative is not unknowable for us. u

4) The materialist will, therefore, attempt to demonstrate that psychological determinations are quantitative, for the same reasons that mechanical, chemical and physiological determinations are. These latter would be the lower degrees of the universe which the ego would crown with a royal sterility. Here are *particles*, in movement; a certain grouping which they form make up the *atom*. Complicate things with a grouping of atoms and you have a molecule. Through *the molecule* you arrive at a complex called *protoplasm* which constitutes *the cell*. In this, you remark movements which you call *irritability* and *reaction*, briefly, a miniature *reflex*, i.e., the feeblest of *sensations* releasing the simplest of *actions*.... Are you in wonder before this so-called originality of life? Then you are no more than an admirer of your own ignorance.... There is no more in this beginning of psychological life than the displacements of electrons, molecules or atoms, and, moreover, the entire psychological life is of the same nature as this beginning. Intensify reflexes and complicate them, and here you have *sensation* properly speaking, then *image*, and finally *associated images*, i.e., ideas, judgments and reasoning. Empiricism actually shows that all psychological life is nothing more than images. Since the time of Democritus, science has shown that the image is only a displacement of matter. Select whatever psychological phenomenon you wish to discuss, and you will find that it is definitely no more than a mechanical movement in a high degree of complexity, produced by the organization of matter. u

d. *Its extreme positions.* Taine wrote : " It (the image) is the sensation itself but consecutive or reviving; and from

u See E. Schrödinger, *Science and Humanism*, p. 29 (Difficulties about the continuous) and p. 53 (the old antidote for escaping the difficulties of the continuous). This shows us how necessary an alliance between the continuous and the discontinuous is, no matter how difficult it is for our thought.

14 It is important, here, to make a distinction between a chronological description and a causal explanation. Showing the progressive complication of an organized whole is certainly a partial explanation of it, for

whatever point we consider it, we find it coincides with sensation" (On *Intelligence*, Vol. I, p. 72). This is the very formula of psycho-physiological parallelism, which, in teaching the exact correspondence between phenomena in a psychological series and phenomena in a physiological series, really identifies the two series, and by this identification reduces psychic life to pure mechanical displacement. The epiphenomenalism of *Maudsley* and *Le Dantec* sees the psychological aspect as being no more than a sterile shadow, which accompanies the only reality there is, material reality. All matter thinks, but in the way in which light produces shadows.¹⁵

2. evaluation

a. This materialist construction is *very appealing* in its simplicity and in its use of an abundance of scientific data upon which it claims to base its pretensions. It beguiles the imagination by its exclusive use of local movement, and even seduces reason itself by the rigid order of its determinism.

b. Moreover, it makes use of *incontestable truths*: (1) The ego is grasped as a movement, and thus it is related to the material universe, which in like manner is apprehended by science as a movement. (2) The movement of consciousness is generally conditioned by cosmic movement. (3) Psychological movement is realized in an ego which is a corporeal being. It is, therefore, a property of matter, in this sense, that it is never experienced outside a corporeal being.

"a bird fashions its nest little by little," and at this level the lesser explains the greater. However, we must point out that this complication demands an energy, and its progressive character exacts a directing finality. Motion and direction are true causes, and as such, they cannot be less than their effect.

u Marxist materialism seems to be retreating from these extreme positions in that it recognizes the qualitative difference between psychology' and physiology and even the superiority of the first over the second. However, it remains completely materialist when it maintains that thought is only an evolved product of matter, and attempts to explain it by the properties of matter. See *Cosmology*, p. 270 and the *Appendix to Psychology*.

c. Nevertheless, materialism *falsifies experience* to make it serve its abstract classifications.,e

1) *It neglects the reality of material qualities*, since it recognizes only 'extension and pure displacement. Now, local movement itself ceases to be a change as soon as one forgets its flowing continuity and reduces it to successive spatial positions. However, these positions can not be truly thought by those who would like to deduce them from indefinite extension. The succession of these positions demands a determining cause and therefore a qualitative one. (See *cosmology*, Third Question)

2) It neglects the qualitative diversity of chemical structures, and, what is even more apparent, the qualitative diversity of biological structures, because it recognizes in them only homogeneous numbers.

3) It does not recognize the natural destinations of the causality at work in the universe, particularly that finality which organic life incessantly reveals, and which constitutes its originality: immanent finality and its frequent consequence, utilitarian finality.

4) Finally, and as a consequence of the above, it does not recognize the specific character of the psychological life. If materialism did not suffer from a chronic blindness, it would already have seen the qualitative in the double aspect of matter's movement and finality. From that it would have been led to conceive the proper character of the finality of the ego: the movement of the ego is immaterial, its finality is immaterial

•• This critique is directly concerned with classical materialism, which is completely mechanistic. This critique, however, must be modified in order to be applied to dialectical materialism. Now, this latter, in its formulas, admits qualitative differences, but it actually eliminates them by giving no other reason for this progressive differentiation, than the single and identical reality of matter. We are forced to say then, either the qualitative newness which appears at a given moment in the evolution of matter is truly new, and therefore demands another cause than matter, firstly for its existence (an efficient cause), and, then, for its introduction into existence at this precise moment (a cause of finalized becoming); or this newness is only a seeming one, and then qualitative difference is misunderstood. Hence dialectical materialism is only repeating the error of strict mechanism.

(immaterial is, here, taken in the sense of non-extended, purely qualitative).

3. *positive proof.* To sense is something other than an agitation of the nerves; to suffer, to will something other than mere muscular contraction. What this phenomenon modifies is not a given extension, e.g., of a neuron or muscle; it is an ego. This ego is not in space, with parts outside of parts. It does not gain weight nor increase its volume or its number. It is not diminished by amputation of a member. But it can gain sensations, emotions, thoughts, and a most assured will to live.

Thus the ego is a movement which has nothing to do with displacement. Consequently, psychological phenomena are *immaterial*, i.e., unextended, and purely qualitative.

4. *objection.* The materialist will object that psychological phenomena can be counted and even measured by reason of their intensity. The psychological facts cannot be "measured" or numbered, because of the nature of the scientist's method. This method, which is based on the real presence of extension, can only attain intensities indirectly. Sensation is measured only by reason of its physical conditions (excitation and reaction), thought is numerable only by its translation into words, the will only by its preliminaries, its objects or its corporeal effects. This should suffice to show that a psychological fact has nothing to do with an extended dimension. Moreover, what is there in this method that would lead me to a knowledge of the ego? Actually, I know nothing more about the ego when I have used instruments or calculation in regard to it. I have only become more precise in what I think of the relations of the ego to certain material conditions in which it moves itself. What are these relations of the ego and its material conditions?

D. The dependence is reciprocal between psychological and corporeal movements.

1. *The former condition like latter.*

There is already a manifest dependence in the psychological facts of automatism: an image goes before the movement

represented, a perception gives rise to the action which is adapted to it.¹⁷ There is even a more evident dependence when reflection has preceded action, especially if reflection had to invent the action by a work of creative imagination or free decision.¹⁸

In all these cases, material changes, e.g., artistic and industrial inventions, deliberated ventures, etc., have preexisted in psychic movements and have been realized only through the orientation communicated to matter by the ego. The feeling of responsibility is only the translation by consciousness of this causal relation of the *ego* to its free works.

Epiphenomenalism has no other choice here but to deny the directive value of the ego on matter, and, in order to explain the illusion which it would have us admit, it makes an appeal to ancestral habits transmitted through heredity. — But to do this is to admit defeat : for habits must have begun, and, therefore, they must not have been in their inception illusory. If there was a time in which the ego dominated matter, why can it no longer do so today, since it has an invincible intuition of it? — The reasons alleged are no more than the postulates of a materialistic determinism, postulates that show no necessity and are contrary to the material facts themselves. Matter devoid of quality and finality is completely unknown to us. Moreover, finality does not have to change the quantity of matter in order to dominate it. It will be sufficient if it directs its movement, and this has a meaning, since the direction of a force is distinct from its quantity.

2. *The corporeal fads*, in their turn, *condition psychological movements*. I have already indicated the general marks of this dependence, which materialism abuses. Let us be more precise about this dependence. We will see it diminish by degrees, as we observe the ego from sensation to free choice.

Sensation depends directly on physical movements, which are the excitants, and on physiological movements, which are

¹⁷ G. Klubertanz, *The Philosophy of Human Nature*, pp. 293-294.
E. Baudin, *Psychologie*, pp. 562-567.

¹⁸ Janies E. Royce, S.J., *Man and His Nature*, pp. 242-251.

modifications of the nervous system. *Emotion*, likewise, is organic, and is accompanied by a host of internal sensations.

Arriving at the *image*, the dependence on external movements is slight, and it seems sometimes almost nil. Cerebral phenomena are required, but experience does not know precisely in what measure. It is certain that the current of images depends on the activity of the nervous system, but it also depends as well, on the complete ego, with its memories, interests and wishes.

Thought is linked to images, to diagrams and to words. In this it depends on the body. Yet it has its own dynamism and its own original laws. It goes into act despite the resistance of the body and in the direction selected by the will. That which necessitates its activity is something other than matter. It is a relation belonging to another order, the evidence of a truth. *

Finally, *the will* applies its choice to physical actions and material objects. It supposes a thought linked to images. In these two ways its operation is conditioned by the body. However, it is impossible to reduce *free choice* to any of these conditions, even to the thoughts upon which it is based and which do not necessarily involve its action. Liberty is the supreme independence of the ego. It is to liberty that the ego owes its personal orientation. This liberty pervades the entire ego with a special autonomy, so that even sensation is sometimes refused to the excitants which solicit it: "Visum fovendo contegat. Ne vanitates hauriat." w

The ego is, therefore, conditioned by matter, but it transcends it even while depending on it, and the more personal it is, the greater the transcendence.

Psycho-physiological parallelism contradicts this conclusion. For it, material events and psychological events form two series, which correspond with each other item by item. Thus it rivets the ego to the body. If it is pantheistic, as is the case with Spinoza, Bain and Huxley, it sees in these two series two*•

*• G. K. Leibertanz, *The Philosophy of Human Nature*, pp. 188-189.

10 Quotation taken from the hymn at Prime in the Breviary.

manifestations of a unique reality. If it is materialistic, it admits that matter alone is real, and declares that the psychological aspect of its movements is epiphenomenal.

a. This fundamental affirmation is, first of all, a gratuitous hypothesis: to say that images and excitations of the nervous system correspond with each other item by item is to lead us to believe that one has "resolved a colossal problem in histology and cerebral physiology" (P. Janet).

b. It is further a misunderstanding of the ego : to suppose that phenomena can be distinguished in the ego in the same way that neurons are in the brain, is to forget the qualitative and mobile character of phenomena.

c. This hypothesis is contrary to the laws of thresholds: sensation does not correspond with every excitation, nor with every nervous impression. It demands a determined level of frequency and intensity, etc.; moreover, the variation in sensation is not produced in terms of every variation in the excitant. The differential thresholds of Weber show the relative independence of sensation. The acme of sensation indicates the cessation of psychological variation without implying a cessation to the increase of the excitant. (*Experimental Psychology*, P. Siwck, S. J., pp. 103-106).

The materialist's error, here, is that : (1) he forgets that the dependence of the ego and of matter is reciprocal; (2) he conceives dependence under the form of a mechanical causality, where the antecedent is equal to the consequent, whereas matter and the ego are not homogeneous; (3) he misconstrues the varieties of this dependence and the suppleness of its bond; (4) he considers the affirmation of this absolute dependence as a satisfactory explanation of the ego, whereas the conditions of sensation are radically incapable of revealing the nature of sensation to anyone who has not already experienced it by living it.

What then does the lived experience of the ego reveal?

E. *Psychological phenomena* are immanent acts.

1. They modify' the very reality which produces them and they remain inside that reality. They may, perhaps, have

repercussions on other realities in the "external" world, but these are secondary and accessory consequences. The only influence which these acts exercise necessarily is that of modifying the ego. Two notions are basic to the notion of immanence : spontaneity and inferiority.

a. Psychological phenomena are the *moments of an undivided movement* from within that in which they are realized, which produces them and which they produce. They are immanent to the ego, as are all elementary events in regard to movement which gathers them together in its undivided duration.

b. More precisely, they are *biological events*, whose immanence in the living is especially marked by the pursuit and realization of individual interests. Attention, association, the fixation of memories, emotion, decision, all are psychological functions wherein immanence appears under the form of a utilitarian finality, where the ego shows itself as the creator of its own good, as a "cause of itself." This latter expression must be understood in a completely relative but real sense.

c. Psychological acts are primarily *conscious acts* or of such a nature that they can be conscious. That is their originality and the mark of their specific immanence. Undoubtedly, the vital activity of assimilation is immanent to a living thing considered as extension; but the psychological facts of sensation, of desire, are immanent to the ego considered as an immaterial thing, as a subject knowing itself. In the degree and in the measure that psychological phenomena unfold, they modify the knowledge which I have of myself, and they unfold precisely because of the knowledge I have already acquired of myself. My consciousness is thus the *source* of my psychological acts, and it finds itself directly and necessarily *enriched* by them : the lived can never become the non-lived. The ego, as *cause and effect* of psychological phenomena, shows these phenomena to be immanent acts.

2. Is this immanence absolute? Is it not evident that it manifests itself *in degrees*?

Idealism does not seem to consider a positive answer to this last question, even in the form of hypothesis. It recognizes the immanence of psychological acts, but it makes that immanence absolute. For it, the ego does not have to draw its thoughts from any other source than its own inexhaustible activity. It does not depend on anything or anyone.

Psychological realism, on the contrary, sees the ego as dependent and, consequently, recognizes in it only a relative immanence. Actually, the ego depends on conditions foreign to itself: its diverse phenomena are ranged in an increasing gradation of independence, which is never a complete and absolute independence, even in the most spiritual choices. In this, psychological phenomena are not completely immanent, because they are not completely spontaneous, but they always have some reason or cause which is "outside" of the ego. They are not completely immanent for yet another reason, and that reason is completely a specifying one. Insofar as these phenomena are conscious, they are essentially relative to objects, to something other than the knowing ego (or the subject).

F. *The ego*, in all its phenomena, actually reveals itself as essentially relative to objects. The ego is not grasped except by reason of its immaterial movement towards objects. It has no conscious acts except by its orientation towards a "beyond," which is proper to it.

1. It is affectivity, and although affectivity seems to close the ego in on itself, nevertheless, affectivity can belong only to an ego which turns toward objects.

a. The affective ego suffers and enjoys, but it neither suffers nor enjoys except by reason of that which it *knows* or *desires*. This is not a mere statement of fact, but one of necessity.

b. The agreeable and the disagreeable suppose more fundamental psychological states, without which these qualifications would qualify nothing. These states are desires or

ideas, which are necessarily relative to something other than the ego.

c. The necessary condition for the existence of affection is an ego which knows itself. Affection is experienced only in a conscious state. Now the consciousness of the ego is not a primitive datum. It is acquired, it evolves from an ego, which, in its first movement, is oriented towards something other than itself, particularly towards the objects of external perception. (E. Baudin, *Ps.*, pp. 131-135) It has, moreover, as its foundation, the act of memory, for recognition can not be a first phenomenon. Therefore, affectivity cannot itself be the essence of the ego. The movement of affectivity, which is a movement "out," presupposes in the ego a movement in an opposing direction, a "reflection" on the subject which is, in a way, the origin of that first movement which is knowledge.

We can conclude that the affective ego bears in itself a relation to objects.

2. *desires* often have definite *objects*. They are often also vague, seeking some determination which might help them along their way towards satisfaction. They always tend in some direction, towards something other than self, even if this would be towards an ego different from the present one, closer to an "ideal" ego. In any case, *to desire supposes knowledge*. Desire does not precede knowledge, it follows it.

You may say that desire guides knowledge, and therefore conditions it. — This is certainly true. However, it does not guide knowledge unless it has first found its own direction in a previous act of knowledge. We must concede the truth of the adage : " *Ignoti nulla cupido.* "

3. Therefore, *knowing* must be recognized as fundamental to the ego. Without knowledge there are neither desires, nor affections, nor personal actions. Now, to know is not an empty movement, devoid of orientation, it is being in relation to a known object: the known thing, by reason of this very relation, is opposed to the ego, it is an *object* in relation

to a *subject*. "Cognoscere est fieri aliud in quantum aliud." n

The lived experience of the ego is, therefore, not that of an ego closed in on itself. On the contrary, the ego is revealed to itself only by reason of movements which bind it to objects, movements which are in no way spatial, but completely qualitative. Therefore, in order to know the ego, we will first have to consider its immaterial relations with its objects, *the essential directions of its ads*. What are they?

** The scholastic idea of the objectivity of consciousness has been rediscovered in contemporary phenomenology. Husserl (1859-1938), its founder, asserts the "intentionality" of consciousness, which Sartre renders in these words: "All consciousness is a consciousness *of* something." (*Being and Nothing*, p. bdi). Sartre goes further and asks himself what reality to recognize in this something, the reality of a pure object perceived, or that of an existence which is independent of consciousness. Now, "the objective will never come out of the subjective, nor the transcendent from the immanent, nor being from non-being" (BN, Ixiii). Sartre reproaches Husserl, because after having defined "consciousness as transcendence," he betrays his principle by making * the noema unreal, a correlate of the noesis, a noema whose *esse* is *percipi* "pure and simple. See J. Wild, *The Challenge of Existentialism*. pp. 188-194; pp. 235-242.

Second Question : How are *psychological acts* to be distinguished among themselves?

Second Thesis : Psychological acts are distinguished among themselves :

1. individually by mutual *temporal relations*;
2. specifically by reason of *correlative objects*.
3. Therefore they differ by species :
 - a) *Knowledge* and *appetency* ;
 - b) *Sensory acts* whose proper object is
A PARTICULAR EXTENDED INDIVIDUAL,
and *intellectual acts* whose proper object is
THE ESSENCE ABSTRACTED FROM SENSIBLE THINGS.
4. There are, therefore, sensory acts *which are intrinsically dependent on matter*; intellectual acts, *which are strictly immaterial* or spiritual.

A. The problem. For *common sense*, the distinction between psychological acts does not present much of a problem. This distinction is manifest in the variety of words which all languages use for transmitting internal experience. You doubt the value of this claim? Well, then, here is the proof! These words demand a certain amount of precision for those who understand them. There is, then, a *specific experience* which corresponds to them. To see, to hear, to be sad, to wish, etc., are really distinct acts. They are, above all, acts whose *essential quality* can be found over and over again in recurrent experiences. Here, definitely, we are face to face with a specifying distinction. " There is another distinction, which is implied in the use of

" " Specific " in the logical sense, is that which is able to be realized in the same way in a number of individuals. A " specific " distinction is that which separates one essence from another one, the difference between " that which is *this* " and " that which is *that*. "

language, and that is a purely individuating one. Without such a distinction it would be impossible to understand how a language with psychological meaning could exist²³ (how could we distinguish one sadness from another in ourselves?).

However, a problem exists for the philosopher. *Bergson*, by his intuitionism, resolves this problem with an answer which is not in agreement with our thesis. According to him, psychological events are not really distinct. To think of them apart from one another would be to cut up the ego into a completely artificial and purely practical pattern, which is useful only to him who wishes to speak of or describe them. The ego, on the contrary, is a duration without any break, which is unceasingly different in itself. In order to find the real ego, we must stop formulating it in abstract concepts "which we link together one after the other in distinct states, like pearls in a necklace, which need something to hold them together, a string which is neither this pearl nor that one, nothing which resembles the pearls, nothing that resembles what a necklace ought to be, a hollow entity, a simple word." ^M Therefore the ego can be known only by an intuition which immediately grasps "the concrete flowing of duration."

Bergson *is right* in this :

1. "The multiplicity of the states of consciousness, seen in their original purity, shows no similarity with the distinct multiplicity which forms a number." "Number is formed by homogeneous parts, one outside the other, and each closed in on itself. Psychological acts form no such number.

2. ° As regards multiplicity, we must admit that there are two kinds..., two conceptions of the difference between the same and the other multiplicity, one qualitative, and the other quantitative. Sometimes this multiplicity, this distinction, this

^{**} E. Baudin, *Psychologie*, pp. 12-13.

M H. Bergson, *La Pensée et le Mouvant*, pp. 88 and 237.

M H. Bergson, *Time and Free Will*, An Essay on the Immediate Data of Consciousness, Eng. trans. F. L. Pogson (New York : Macmillan, 1950). P- 121.

heterogeneity, contains number only potentially, and it is simply a question of counting the multiple termini of vital acts, but then we are thinking of the possibility of exteriorizing them in spatial relations. Unfortunately we are so used to clarifying one sense of this word "multiplicity" by the other.... that we experience great difficulty in keeping them apart, or in at least expressing this distinction in language." This danger is only too real.

3. Concepts are imperfect. (1) Being abstract, they are incapable of expressing all of experience. He who has never experienced joy, for example, can not, as the one who knows it by experience, discover it by the formulation of an abstract definition of it as "a feeling resulting from a good experienced as present." In the same manner, a man born blind will not know color, despite the descriptions of the physicist and the psychologist. (2) A concept devoid of a sensory content, and in no way intuitive, is incapable of representing that which is individual. (3) An idea is formed habitually with the aid of images. Hence the danger of considering our thought objects, which are distinct concepts, as if they had distinct positions in space.

Bergson, however, in his reaction against empiricism, seems to *misunderstand* : "

a. The distinction between psychological acts. This distinction is, nevertheless, natural and objective, for the same reason that the continuity of internal duration is. The distinction between psychological acts is, as is the continuity of internal duration, based on experience.*•

*. *Ibid.*, pp. 122-123. It would be more correct here to oppose numerical multiplicity ("predicamental number") to ontological multiplicity ("transcendental number"). This twofold meaning is very clear in phrases like the following : one foot and one foot make *two* feet; Einstein and myself are *two*. Two, in the sense of an addition of two homogeneous dimensions. Now we can also use two in the sense of a radical opposition, that of two beings without a common measure. Psychological multiplicity is, above all, heterogeneity and distinction.

• E. Baudin, *Psychologie*, p. 14.

b. The value of analysis compared to intuition. Analysis, which is achieved through abstraction, clarifies and makes more-precise the synthetic intuition of the ego. Some communication about the ego is possible through language, which is the result of analysis, and thus the ego is capable of being enriched by social influences. Without analysis, the initial confusion of our intuition of the ego would remain the definitive state of our knowledge.

c. The value of a differentiated psychological life. True life should, far from being the least conscious, be the most conscious. The most personal life, that of the free ego, is at the same time the most conscious.

d. The value of abstract concepts. Imperfect though they may be, they are nevertheless not unsuitable for representing things. We are not obliged to stop at their content as at a limit. On the contrary, by their content they help us to perfect our knowledge, both by a periodic return to the original intuition, already better known because of them, and by stimulating us to a vigorous research for those aspects of things which are still unknown to us.

In order to know the ego with a clearer and richer intuition, we must distinguish the diverse aspects of it, not for the purpose of separating them, but rather for the purpose of understanding their union better.

B. The individuality of psychological acts is nothing other than their situation in the temporal unfolding of the ego. I hear a melody, and then I hear it again. The two moments of my life are distinct. Why? Is it not because each moment carries a mark in duration which opposes them? *One is past and the other is present.* They may resemble each other in a thousand ways, but they remain irreducibly two, because of their heterogeneity from the point of view of duration; when the second will have passed, it will still be other than the first, and will continue to be distinct from it.

You may object that the acts are individualized by the objects to which they refer. My auditory attention would, therefore, be multiplied, according to the melodies or the sonorous

objects which would interest it. '• This viewpoint is not false, for there must be objects, if there are acts tending toward them. Yet this viewpoint lacks preciseness. The question here is not one of knowing how to distinguish psychological acts from outside through an objective chronometric indication, but rather a question of knowing what individualizes the moments of the ego from within itself. Without objects, undoubtedly, the ego would cease to move itself or to be aware of itself, but, when it moves itself, it is in sensing its own change that it is able to distinguish the stages and acts of that change. It is even by reason of its own duration that it first begins to appreciate the duration of things.¹⁰ It is because I am aware that my present experience is distinct from a similar past one, that I think of this as the objective repetition of the melody heard. The objects of acts are only the general condition of the individualization of acts. To link the movement of the ego to that of its objects by a kind of parallelism, would be to forget the ego's spontaneity. Before the tiniest flower that holds my gaze, how many distinct acts are able to arise from within me !

You might say, with Bergson, that the ego certainly presents a successive diversity, but in no way a fixed distinction between states. To admit a fixed distinction between states would only create an illusion that an ego which resists all division is actually divided into two or three distinct acts of hearing.

This objection forgets that the ego is aware of itself naturally, according to the *law of the finite*, * which is that of every*•

le Systematic examples : (1) A specific distinction : I *hear* a knocking on the door and I *see* Mr. Durant come in; (2) A distinction based on individual objects : seeing *Mr. Durant* come into the room, I also see that he is followed by his son *Hector*; (3) A distinction based on individual moments of time : engaging in conversation with Hector, I *see* Mr. Durant *again*, whom I had forgotten for a moment.

*• E. Baudin, *Psychologie*, pp. 210-214.

•• Perception analyzes the sensory field, by breaking it up into areas. It also synthesizes by giving a structure to the sensory datum according to certain * forms, " whether by virtue of imagination or intellect. At any rate, every perceived object is a determined finite object.

Perception of external objects is halted by spatial limits. Consciousness of internal states has temporal limits, pauses, beginnings, or simple rhythmic variations in psychological movement.

perception. True, the movement of the ego is not divided by *absolute stops* which are followed by recommencements. Such a division is not required in order that *rhythms* be distinguished. It is sufficient, for example, that intense moments of consciousness alternate with others, wherein the attention *slackens*, that one function acts in relation to another, that a single psychological quality appears and disappears. Thus, I can distinguish different acts of attention — the different judgments I express in a conversation, — last night's dream. There is no need to divide the ego. It will be sufficient if it presents variations through which my mind can recognize the universal in both the transient present and the remembered past. The legitimacy of such an abstraction cannot be denied.

The individuality of a psychological act is, therefore, definable by reason of its temporal character. It is constituted by its relations to anterior and posterior acts (of whatever nature they may be), and to simultaneous acts (which are, in such a case, necessarily of a kind different from its own).

To admit this individuality, is first to recognize, as does Bergson, that the consciousness of the present is linked to the memory of the past and to the imagination of the future. Yet we must part company with him when he denies the right of abstraction to distinguish the hidden rhythms in the movement of consciousness.

C. The specific nature of psychological acts can be recognized only by their relation to their " formal object. "

The reason for this is that they are essentially relative to their objects. They are conscious acts only by reason of the knowledge (or desire) they give us concerning their objects; but it is also by reason of their correlative objects that they unveil for us something of their specific nature.

However, let us be careful not to consider these objects in themselves, in their brute reality. "*Material objects* " ³¹ (i.e.,

³¹ Do not confuse the different senses of the word " material " :

(i) as opposed to the immaterial, we have :

(a) material « extended; in this sense, sensation is not material.

things as they *are*) are not able to specify psychological acts, for they are evidently something which the latter are not. It is "*formal objects*" which specify, i.e., objects such as they are known, or, more generally, such as they are attained by the acts, for it is this correlation alone which relates the act to the object. Thus it is not "this tree" which specifies sight or desire, but "this tree insofar as it is colored," or "insofar as it gives shade."

An object can, however, be attained by an act in a number of its determinations, or "forms," at the same time. Thus, I see the color in this tree, its configuration, its position, the swaying of its branches, its place in the countryside, etc. Now, in a precise sense, the formal object, the object strictly correlative with sight, is not the total of these determinations, but only that form which is attained *for itself* (*per se*), and encountered as if *by the first thrust of the act* (*primo*), and by reason of which the act can attain other forms. In this case, that is color. Briefly, then, a psychological act is specified by its formal object, by the object which is attained "*primo et per se*."

You may object that, here, we are going around in a circle. To define an act, I must have recourse to an object; but in order to know the object such as I attain it, I need to know the act. This would be a glaring vicious circle if we were here speaking of a conclusion, or if we were attempting to construct the nature of the act from the formal object, and had to suppose that this was the first and only thing known. On the contrary, I never have to define either the act or the object as if I did not know them before, for *I grasp them* both in their very correlation, through a simple reflection. Therefore, I do not have to deduce the act from the formal object, nor the formal object from the act. In the first instance I would be constructing an arbitrary psychology, in the second I would have to know the ego in a

- (b) material — essentially dependent on extension; in this sense, sensation is material.
- (2) as opposed to formal, we have :
 - (c) material — not yet determined but determinable. Formal = determined and determining, completely characterized.

pure state. Very simply, then, I have to analyze my own internal states by an attention which moves its light from the object to the act, and, inversely, from the act to the object, without ever being able to grasp either one in a complete state of isolation from its correlative. Thus, I learn to know the relation which unites one to the other, and, consequently, the nature of the act which produces this relation.

The natural method for distinguishing various kinds of acts is through an analysis of consciousness and not through an a priori deduction. It is a case of unraveling the data which are first attained, * *primo et per se*, " in the multiple acts of consciousness. This is difficult work, but not completely impossible, since it has already begun. Common sense alone is sufficient for us to be able to discern color from sound and taste. Scientific psychology recognizes the originality of a sensed movement, of a lived duration, of a perceived extension, the distinction of an object thought and an object imagined. By differentiating functions, science is, at the same time, differentiating formal objects.

Bergson would object here that this classification of objects and acts is arbitrary and unsuited for giving us a knowledge of the ego. Why declare *color* the formal object of sight, rather than *each* of the colors with its nuances the formal object of so many particular kinds of sight, or why not rather declare *quality in general* the formal object of only one kind of acts, the sensation-image? — Why? For practical reasons, without a doubt! Every classification is a work of logic, an "*ens rationis*," and, on the other hand, the psychologist finds it more convenient, if he can, to adapt his classifications to the language and classification which the language implies. But this is no reason to say that classification becomes by this completely arbitrary and false, for it always represents the real relations between acts and their proper objects. Therefore, it remains capable of giving us a knowledge of the ego. It is even a necessary method. We can not know ourselves without the benefit of abstractions, nor can we abstract, unless we set up general kinds and species, because that which is capable of being generalized is nothing more than the abstract.

Acts are, therefore, truly known by their relation to their formal objects. The degree of abstraction in which we may choose to consider these relations depends on us, but the process of abstraction does not permit us to construct the relation to their object. This is a simple case of observation.

Let us observe this relation of acts to formal objects, and let us limit ourselves to the least debatable degrees of abstraction. Let us first consider knowledge and appetite in general, and then in the two orders of sensation and idea.

D. Knowing and loving are specifically different.

1. THE FACT OF THE DISTINCTION

a. is recognized by *common sense*.

1) The symbols which designate them already indicate this. The "heart" often goes against the interests of the "head," and sometimes vice versa. Knowledge is a "light" for man, and love is likened to "warmth." These expressions seem to indicate knowledge as an experience of repose, a state, while loving seems to indicate a movement, a force.

2) The moral conscience is definitely in favor of the distinction. "Video meliora proboque; deteriora sequor." The knowing of the good and the wishing of the evil combat each other in temptation and remorse.

3) The values of the good and the true are clearly distinct. "It is not good to speak every truth." Now these two orders of values are based on knowledge and love.

4) The dependence of desire on knowledge is a further proof of their distinction. It seems that I can limit myself to knowing without desiring, but I can not desire without knowing. However, the separability indicated above is less real than it appears, "and in this alone we do not have a valid proof for our position, unless knowing and loving are, first, perfectly distinct notions. Now it seems undeniable that the activities referred to by these distinct notions are also distinct in reality, since our

M This is because of the antecedent influence of the will on some of our judgments. See P. Foulquié, *Psychologie*, pp. 574-577.

consciousness testifies that they vary in opposite directions. "Sensation (affective element) and perception (representative element) are in an inverse ratio to one another." ³³ Here, common sense readily admits Hamilton's law.

5) Catholic theology uses this empirical distinction. Thus, the correlative opposition of knowing and loving expresses the distinction of Persons in the Blessed Trinity. The Word is generated by the Father, as a judgment expresses the knowledge of the knower; and the Holy Spirit links the Father to the Son, as the bonds of love bind him who loves to the object that he loves. Further still, Faith is above all a knowledge, while Hope and Charity are a love, and their separability clearly marks their distinction.

b. However, this distinction is diminished in the eyes of ■ *psychologists*.

They see in a clearer fashion with their more "objective" viewpoint, (more external), the similarity to physiological conditions which these two kinds of phenomena have. Moreover, by reason of a more analytic introspection, they are able to see the identity of these conditions in their grasp of consciousness.

The tendency to identify the facts of knowledge with those of affectivity and action is manifested in two opposite directions.

1) Some *reduce knowing to acting*. Thus, for the Cartesians and the pragmatists,³⁴ sensation is simply the beginning of action, an excitation which is received and sent back under the form of movement. For Bergson, ideas share the lot of images and sensations, and they play only a practical role, i.e., pragmatic action.

2) Others *make feelings a kind of knowledge*. The peripheral theory of emotion (W. James, Lange) sees emotion as a sensory awareness of corporeal modifications which pervade the whole organism and which follow an excitation. The Stoics and the Cartesians make pleasure and pain consist in free or necessary judgments. «

" See Brett's *History of Psychology*, p. 477.

M E. B a u d i n , *Psychologic*, pp. 155-156.

M *Ibid.*, pp. 506-510; 492-493.

3) Still others, following the same tendency, reduce the *facts of activity* and of inclination to a *foreknowledge* of the future. It is this that Spencer and other partisans of psychological determinism have done in the matter of free will.³⁰

This assimilation of knowing into loving and vice versa, which is contrary to the ordinary experience of consciousness, is not proposed, however, as absolute. Thus, in the first case, there remains a realm of pure knowledge, which, for Descartes, is that which is derived from innate ideas, and, for Bergson, that which is contained in intuition. In the two others, a certain difference, remains implicit in the assimilated states. Thus, according to William James,³⁷ the situation is not having an emotion, but * being aware of a strong emotion, " which is " being aware of its organic expression. " Emotion is seen as being constituted by physiological movements rather than by their sensation. In Descartes (VI Meditation) the feelings of hunger and thirst, for example, are not pure judgments coming from understanding alone, but from " certain confused ways of thinking which occur because of and in dependence on the union of matter and spirit which is a sort of mixture. " — " If this were not the case, then, whenever my body would be injured, I would not be sorrowful about it, since the ego would be only a thing which thinks, but I would perceive this injury by understanding alone, as a pilot perceives through his eyes if something breaks in his ship. " Thus, feeling supposes *the* body, i.e., a mechanical movement of extension, and it supposes *my* body. Being the knowledge of a subject as subject, feeling is distinct from knowledge properly so-called, which grasps an object as object, i.e., as something other than the subject.

For Leibniz, free will is not simply knowledge, but a spontaneity proper to the intelligence, through which motives are selected, with a view to the recognition of the best among*•

*• According to B a u d i n, all psychological determinists in the matter of will are concerned with prediction and make a fatal mistake of imagining motives as physical forces, which, if they are equal, can neutralize each other. *Psychologie*, pp. 601-605.

*' W. J a m e s, *Psychology* (Briefer Course) (New York: Henry Holt, x9-°)« p- 375 ».

them. To admit an order proper to the Good is to distinguish it from that of the True, and thus to distinguish activity from knowledge.

Thus scientific research mitigates but does not suppress the empirical distinction. What it very definitely shows is the vital unity of these aspects of the ego. Active and affective love are not me except by the consciousness I have of them, or am able to have of them. Therefore, they are penetrated with knowledge, both sensible and intellectual, in varying degrees. Sensations, images and judgments find their place here, but on the condition of not being emptied of their specific object without which their psychological originality would vanish. What, then, is the object of this love, whether it be active or affective, and what are its relations to the object of knowledge?

2. THE REASON FOR THE SPECIFIC DISTINCTION between knowledge and desire can actually be found only in their correlative object.

to know has for its object "the other as other, modifying by its own determinations the knowing subject which grasps it {or sees it}." Three aspects are, here, grouped together: (1) the object — as such — is real, independent of the subject, and imposed on him; (2) the object is intimately present to the subject, not in a spatial manner, but by an immaterial communication of its characteristics to the subject; (3) the object is perceived, grasped, looked upon. To know is — or better still, supposes — at the same time that there is: (1) *a relating of self to another*, endowed with a kind of "personality" correlative to mine, in a word, to another which is a thing, a being; (2) *a being similar* and — considering the knowing ego only as it is in act — *identical* to the thing, but in a completely immaterial way, which is called "intentional"; (3) *a seeing of the object immediately and intuitively*. *

* See J. Le ROBBLEC, *Problèmes Philosophiques*, pp. 3-11, 19-24. These three aspects have given rise to three theories of knowledge: realism, idealism and intuitionism; they justify them in the measure that the three theories are harmonized.

The first of these aspects is best shown in the act of judgment. Judgment implies a necessary relation to the truth, and it is either true or false. It is always lived as if it were true. Truth and falsity are in it, because the judgment asserts that it is true. Now the "true" implies a relation of thought to an object, which is *totally independent* of it and completely other.

But, *you may say*, can I not construct an object, like a triangle or a circle, and make a true or false judgment about it? "A triangle is able to be inscribed within a circle; the length of the radius varies within the same circumference." Where, then, is the pretended independence of the object? — In the act itself by which you *know* the object. If you predicate of a circle, once constructed, what is proper to a spiral, you make an error. The object condemns you. To construct an object and to know it are very different things, even when the construction is purely mental, and takes place by virtue of a genetic definition. There is nothing that demonstrates better the value of this first description than the impossibility of applying it to operations, whether they are preliminaries to knowledge (the formation of an idea), or derivations of knowledge (action, e.g., guided by knowledge).

Moreover, truth is a characteristic proper to judgment. Must one, then, deny that sensations and images belong within the order of knowledge? By no means. They must, however, be situated in a lower degree of knowledge, as being the beginnings of judgment. They carry within them the seed of truth or falsity. They are the matter of true or false judgments. They have a content, which is already completely relative to an object. Their inferiority flows from this, that they are not aware of this relativity. In judging, on the contrary, one is aware of this relation.³⁹

The second aspect of knowledge (to be similar and identical in an completely immaterial way) is also best shown in the act of

³⁹ J. M A R I T A I N, *The Degrees of Knowledge*, Eng. trans. G. B. Phelan (New York: Scribner, 1959), pp. 87-89, and notes on pp. 83, 89, especially the reference to *De Veritate* I, 9; J. de T O N Q U É D E C, *La Critique de la Connaissance* (Paris: Beauchesne, 1929). PP. 232-239.

judgment, which alone is capable of producing true knowledge. To be true is *to be in conformity* with the reality judged. In a descending degree, a perception, a memory, an image, a sensation is true in the measure in which this *equality* between the knower and the object is there realized, even though it may still be in an unconscious manner. This defines the nature of truth for all. "Veritas adaequatio intellectus et rei" is the scholastic expression of it, and here is that of Hamelin: "Truth, in whatever manner you define it, implies an agreement of the subject with the object." The divergencies emerge later when it is a question of defining just what the object of knowledge is. We will reserve the full solution of this problem to the Critique of Knowledge, and for the present simply hold on to this: that, psychologically, to know is to be the object known, to be made one with it. The attribute of a true judgment is that it is at the same time an expression of the object known, and an ideal content of the thought of the thinking subject.

The third aspect pointed out is the most inexpressible of all, as well as the most purely experimental. There is in all knowledge a *vision*, i.e., something intuitive, a relation which is completely immediate to the object. Actually, intuition is the beginning and the term of all knowledge.

How can we reason, i.e., pass from one idea to another, by knowing the why of the passage, unless in going from one why to another, we ultimately reach a why which is seen without a demonstration? Undemonstrables which are seen are necessary for demonstration. Thus reasoning begins with an intuition, that of first principles, and it terminates in another intuition, that of a true conclusion, grasped as the "logical consequence" of the whole chain of ideas which established it.

We might, moreover, add: How can we *fudge* without believing in the truth of the judgment, i.e., without having any direct or indirect *evidence*.³

As for the *simpler acts of knowledge*, which have no consciousness of the relation they bear to an object, they still present this object in the most immediate way possible, although they are ignorant of the duality of the ego and the actual object;

this duality is nevertheless inscribed on them. Images, sensations are simply the pure grasp of a certain object, as are the ideas, which the Scholastics rightly call simple apprehensions. Great credit is due to Bergson for directing attention to intuition as being an essential characteristic of knowledge. His great mistake was in not recognizing the value of the lesser intuitions, those of sensations and ideas.

The three aspects of knowledge are, therefore, justified. Can we not *simplify them*? It is sufficient to indicate that the first two are not truly different. They express the ontological side of knowledge. The third expresses its psychological and conscious side, and it contains the two others. How do we grasp ourselves as identical with the object (2nd aspect) despite its opposition to us (1st aspect), i.e., with an identity which is other than physical (intentional), unless in an intuition of the object (3rd aspect) which is the basis of the judgment? " $2 + 5 = 7$," "I am in agreement with an object which resists me at this moment, which would condemn me if I thought that $2 + 5 = 6$, and I know that I am in agreement, because of the vision of that object posed in me by the constitutive ideas of my judgment.

Very many other notions of knowledge have been proposed. For empiricism, knowledge is the passive reception of an object by the subject. For idealism, knowledge is reproduction, a representation, or even a total production (absolute idealists) or a formal construction made through "a priori" forms (Kant). — None of this is essential to knowledge. All this can exist, but only as conditions in particular cases. Thus sensation supposes a nervous and psychical receptivity. Imagination and memory suppose a recall, a re-creation. Every discovery supposes a kind of spontaneous production, which is especially frequent in mathematics. Knowledge, however, is something other than this. It is something which a philosopher as profound as Hamelin was forced to admit, despite his faith in idealism. He says, that under the theoretical aspect of knowledge (which he opposes to its practical and affective aspects), "the representation is... contemplative and not active, it observes, it does not make." (*Essai sur les Éléments principaux de la Représentation*, p. 376).

We can conclude that the object of knowledge is the *other* as other, *identified* "intentionally" with the subject and *contemplated* by it.

Loving has a very different object. The object, here, tends to become an alter ego, to the extent of being almost indistinguishable from the ego. Instead of being identified intentionally with the subject, the object draws the subject, through the affection which it begets in him, to modify himself physically, so that he might adapt himself to it. However, much love is presented willingly as having some special insight that the mind does not have, it is the blindfold with which mythology endows it which here symbolizes truth.

The Scholastics, like Aristotle, limited themselves to separating appetite from cognition, and to a very careful delineation of the differing acts of appetite. Both empirical and philosophical usage has accustomed us to speak of the two distinct zones existing in the ancient notion "appetitus," one of activity, the other of affectivity. W. James, for example, thus differentiates "instinct" from "emotion": "In the presence of any object, every animal can experience two reactions, which are psychologically distinct and determined, one of which makes it feel, and that is emotion, and the other which makes it act, and that is instinct." He observes, and rightly so, that it is difficult to say if it acts, in a given case, by emotion or instinct. "Every object which excites an instinct likewise excites an emotion. There is only this unique difference..., an emotional reaction is limited to the body in its expression, whereas the instinctive reaction is further susceptible of placing the animal in communication with the object which provoked it."¶ The term "instinct," as used here, lacks precision. It would be better for us, in order not to leave the psychological domain, to speak of love under its active and affective forms.

a. active love is in play in *every* action with a psychological inspiration, whether that action is free or not. This is true in technical action, in esthetic creation and in moral life.

To act is simply to pursue an end. To act psychologically is to act with knowledge. Now, a known end is a good which we desire and love. The "reason why" of any psychological act is, therefore, always a love. || Reciprocally, love always implies an inclination, i.e., a movement either pursuing a good, or flying from an evil. This movement is, moreover, completely qualitative. The physical displacements which take place in the body are only consequences of this love and can even be lacking. Love is more interior than any action it inspires.

What is the object of this active love? "Materially" it is the same as the object of knowledge, but "formally" it is not the other as other, it is the other as it can be good for me or agreeable to me. ¶ It is the other as capable of satisfying my tendencies to act in a direction which I confer on myself, and through that, on the object which I desire.

In *technical* activity and in *esthetic* activity, desire seems to tend even to the transformation of the external object, which is the "matter." Definitely it is the work of the instruments which manifest the activity of the worker, the potter, the artist. Nevertheless it is not the movement of the instruments through muscular contractions which is the object of desire. This object is beyond that, and lies in a certain result which is sought for itself (in an end) and is already present in the desire and defines its direction, mine. Thus the object of a technical or esthetic desire is a thing, not to be taken as it is in itself to be assimilated, nor to be contemplated, but to be transformed into

"*Summa Theologiae*, I-II», q. 28, a. 6: "Omno agens agit propter finem aliquem...; finis autem est bonum desideratum et amatum unicuique; unde manifestum est, quod omne agens, quodeumquo sit, agit quamcumque actionem ex aliquo amore." This is a question of love in a completely general sense, "prout comprehendit sub se amorem intellectualem, rationalem, animale, naturalem" (ad xum), in the sense of the operation of a tendency, "appetition," a spontaneity in action.

42 *Summa Theologiae*, I» pars, q. So, a. X, ad xu: "Id quod apprehenditur et appetitur est idem subjecto, sed differt ratione: apprehenditur enim ut est sensibile vel intelligibile; appetitur vero ut est conveniens aut bonum; diversitas autem rationum in objectis requiritur ad diversitatem potentiarum, non autem materialis diversitas."

that which makes it coincide with the idea which directs the desire and which is the guiding point, the terminus of this kind of movement.

There is, however, an activity which, in itself, is not concerned with external matter : *moral* activity. It must have as its inspiration the highest degree of active love, since it is, in itself, more purely psychological. Has the love which animates moral life an object which can be described in the same terms as that which inspires technicians and the practitioners of the fine arts? Does it have as its object *something which is to be transformed*? It certainly has. An indefinite field of possibilities, which is the very condition of choice, opens up before liberty to an even greater degree than before technique and art. " You become what you will. " Without active love, moral action remains asleep. There are too many contrary directions for moral activity to take, and it remains indetermined and even non-existent without active love. Whether I be an honest man, a pleasure-seeker, or a saint, must I not choose, lest I kill within me that love of self which wishes to live. This choice of an ideal has been the first transformation of this vital matter which is my future ego. Each new free decision has oriented my future in a more precise direction. Victories and defeats, virtues and vices, have been building and will continue to be built in me. Active love is no less transforming in morality than it is in the arts. It is even more immediately transforming, for the modifications which it brings, being purely psychological, are realized without any delay.

Here, then, we have arrived at *the first characteristic of the object of active love*. This object is real — having the reality of the material, of artistic matter, of the free ego, — the activity on this object is one of *transformation* in the direction which love implies. Thus love tends, as does knowledge, to the union of the subject and the object. But in an inverse fashion, knowing respects the real integrity of the object and modifies the subject only, whereas loving (in its active or effective sense) changes the object in its very reality by bringing it into agreement with the subject.

A *second characteristic* can be derived naturally from the first. Active love, being a movement, implies a need, a lack, which is that of its term. The object of love is, thus, that which satisfies a need, that which suppresses the search and gives to the subject the richness, the perfection which it was lacking; in a word, what is *good*, what is *suitable* to a being, what is *in accord with its tendencies*. "Bonum est quod omnia appetunt." "We must, however, be more precise. (1) The "suitable" for *technical activity*, is, above all, the result. "A result, being posed as an aim, the proper task of technical activity... is the procuring of the result.... The result is so highly important in technical activity, that it can be obtained indifferently through the most indirect and bizarre means, provided these methods correspond to the norms of utility." 41 (2) The "suitable" for *esthetic activity* consists, above all, in the means: "An activity is esthetic because of the method it follows, because of the concatenation of means through which it offers a spectacle, and never because of the results which it obtains.... To take one example out of thousands: in the field of literature, the inner meaning, i.e., the thesis to be demonstrated, is without importance from the point of view of art. It is only an excuse.... All that is important is the manner in which the literary activity is used in the midst of the difficulties of demonstration, finding its arguments without effort... and proving it without having given the impression of a proof." 42 (3) As to *moral activity*, the good, here, is first of all the end or purpose, but the end with all the organization of means which its realization supposes: "The will implies an end, since to will is to will something. It also implies means, for otherwise it would be no more than a vague wish, perhaps a desire for the impossible.... The will is, moreover, the living support of the end and the means, the

° *Summa Theologiae*, I pars, q. 5, a. 1. "Bonum ... aliquid est, secundum quod est appetibile," is a definition which follows that of Aristotle, * Bonum est quod omnia appetunt," which is cited in the *Summa Thcol.*, II pars, q. 5, a. 2, ad 2um.

"This is a translated quotation taken from Hamelin, *Essai sur les Eléments Principaux de la Représentation*, pp. 444-445.

« *Ibid.*, pp. 446-447.

concrete thing, whose end and means are only detached moments. " "

Consequently, it is love as the inspirer of moral action, the love of the Good, which animates all human activity, since it has for its object both means and end.

The object of active love possesses a *third aspect*, which is that of *finalizing determination*. It is not a reality which can be transformed in any direction, but it is to be transformed in a definite direction, giving love its orientation.⁴⁷ As a result of this observation, we have a problem. Whence does love receive its determined object? (See Third Question). We could answer with St. Augustine: it is the pleasure experienced or imagined which orients the activity towards its definite object. "Non enim amatur nisi quod delectat" (Sermon 159). In another place: "Delectatio quasi pondus est animi" (De Musica, VI) approaches the "Pondus meum amor meus" of the Confessions (lib. XIII). This would be a subordination of active love, the "weight" of the soul, to affective love which enjoys and suffers. St. Thomas and Hamelin, following Aristotle, are in agreement here in opposing the opinion of Augustine. They hold that pleasure and sorrow do not exist without the activity which engenders them, and they attach action, not to the emotions, but to knowledge and to natural active tendencies.

The resolution of the problem posed forces us to look first into the object of affectivity.

b. affective love is expressed in sensations of pleasure and pain, in feelings of joy and sadness. Here is how St. Thomas describes pleasure: "Est enim delectatio *quies appetitivae virtutis in aliquo bono amato et consequens aliquam operationem*" (S. Th., I-IIa2, 34, 1). Pleasure demands the fulfillment of two conditions: "conjunctio boni et perceptio hujusmodi conjunctionis." The same is true of sorrow: "conjunctio alicujus mali quod ea ratione est malum quia

⁴⁷ This is a translated quotation taken from Hamelin, *Essai sur les Eléments Principaux de la Représentation*.

* The object of active love can, therefore, be summed up, as that which is known as transformable, as corresponding to some need or aptitude and which, as such, directs the action.

privat aliquo bono, et perceptio hujusmodi conjunctionis ” (S. Th., I-IIae, 35, 1). These two conditions imply a third, namely, that the object of pleasure or of sorrow should be a good or an evil for him who is united to the object. In another place, 48 St. Thomas expresses what this ” conjunctio boni ” is in more psychological terms. It is an assent to an object. A resting in it, a manner of making it one’s own within the self. The object of affective love could be described, in the manner of St. Thomas, as that which is *suitable* to the subject and is *intimately -present* to it and both of these aspects are simultaneously *present to the subject*.

Is not the good object, then, the *direct* cause of pleasure? No, it is only indirect,⁴⁹ and this for two reasons. First, there must be an *action* which unites the subject to the good object. Certain pleasures demand no other previous activity than that of knowledge, e.g., the enjoyment of seeing a show, the happiness that occurs on hearing some good news. Others demand actions which bring the thing to the subject, adapting the object to its ends, placing it at the service of the subject, e.g., as is the case in the tasting of wine.

But a second condition is required. In order to make me happy, it does not suffice to have an action place me in possession of a coveted end. That union of the good and the ego would be completely objective. Pleasure arises in consciousness only at the moment when *I know* this union by an *original experience*. Besides objective knowledge and appropriate action, pleasure

⁴⁹ *Summa Theol.*, I-II», q. 33, a. 1, makes a distinction between the aspect of knowledge and that of appetite in pleasure. As to the former : ” apprehendit se homo perfectionem quamdam adeptum, quae est spiritualis magnitudo ” (man feels himself as having made an acquisition). As to the latter : ” {virtus appetitiva) assentit rei delectabili, et in ea uiuescit. quodammodo se praebens ei ad eam interius capiendam : et sic dilatatur affectus hominis per delectationem, quasi se tradens ad continentium interius rem delectantem. ” Man extends himself to receive the delectable object, and enfolds it within himself, and is harmoniously in accord with it in all repose.

⁵⁰ *Summa Theol.*, I-II», q. 32, a. 1, ad 2^{um} : ” Ipsa objecta operationum non sunt delectabilia, nisi in quantum conjunguntur nobis; vel per cognitionem solam... vel quocumque alio modo simul cum cognitione. ”

demands an experimental knowledge of the union between the good and the subject as such. It is, undoubtedly, this condition which has given some likelihood to intellectualized theories of pleasure and sorrow.

Hamelin recognized these two conditions. He says of pleasure, that it is "*the appreciation* by the subject itself, from its own point of view as subject, of a state, in which it has experienced the satisfaction of a tendency."⁴⁹ "Once the tendency is satisfied, this satisfaction *affects the subject as it is receptive and passive*.... This reverberation, which is analogous to sensation * — but not identical with it — " is the feeling of pleasure."⁴⁰ Moreover, a tendency can be satisfied through anticipatory imagination as well as through a perception. Hence there is pleasure in hoping.

If this analysis is correct, it is clear that affective love is not the basis of activity, but flows from it. Actually, without a satisfied tendency, without an action satisfying it, no pleasure is conceivable. The formation of a habit happens to be an outstanding example of what we have just said, and it shows that pleasure begins only where activity is already present. An action which is indifferent or even disagreeable at first, by being repeated, strengthens and gives direction to a tendency, and thus creates a need, a new source of pleasure or pain.⁴¹ Thus we see explained what is variable in affectivity, and its dependence on individual evolution and social conditions.

The analysis just attempted also shows affective love to be an original psychological attitude, irreducible to active love, and as specific as it is. Affection is another thing than the result or the end pursued through action. If the object of action is the end to be attained, the object of pleasure is the end attained. Pleasure completes the act, but without being identical to it. It is rather "an effect of the act, a repercussion of the act on the subject, a state derived from activity.... but passive in itself." "49

⁴⁹ Translated quotation from Hamelin, *Essai sur les Eléments Principaux de la Peprésentation*. pp. 477 and 475.

" *Ibid.*, p. 469.

" *Ibid.*, p. 474.

St. Thomas thinks so too : " Pleasure perfects operation, as an end which is realized in superabundance. Operation constitutes a first good, and another good is added to it, pleasure. This good consists in the appeasement of desire, put at rest by the good which is first realized." w " In this way, action is the productive cause of pleasure " (ib. ad 2um).

The distinction between affectivity and action which is claimed to be a modern one was, therefore, not unknown to the Aristotelian Scholastics. They were careful not to transform this distinction into a mortal separation. This supple manner of distinction was also employed by them in distinguishing knowledge from action, not for the purpose of placing one opposite the other, but rather for the purpose of uniting them in one single life. There remains for us the task of showing the vital links between knowledge and the two forms of love.

3. the vital unity of knowing, acting and sensing has not been destroyed by the preceding analyses. It is important now to bring this unity to the fore, if only to recapture the initial intuition of the ego. The ego is continuous knowing, acting and loving. The role which *analj-sis* plays is that of allowing us to grasp the order which synthesizes the ego's movement and presents it as a whole to the intuition.

knowledge is the necessary foundation of *psychological life*. Undoubtedly, knowledge supposes a tendency, i.e., an activity apt to be excited by sensible qualities, but this tendency is "unconscious." It is the "*natural appetite*" required for every change, the innate destination found in all that becomes. It conditions psychological life, but remains outside of it.

a. Here, then, the subject is enriched, through knowledge, by the immaterial possession of the quality ("of the form")

" *Swnma Theol.*, I-II®, q. 33, a. 4 : " Delectatio perficit operationem, sicut quidam superveniens finis; inquantum scilicet super hoc bonum quod est operatio supervenit aliud bonum quod est delectatio, quae importat quietationem appetitus in bono praesupposito. "

Ibid., ad 2U" : " operatio causât delectationem sicut causa efficiens; delectatio autem perficit operationem per modum finis. "

of another. Since this is so, the subject is enabled to act in a new way, with a consciousness of its direction towards the object known. All that the subject is, is apt for acting according to the determinations which it possesses. The aptitude for action in the knowing subject is therefore increased and made more precise. This aptitude has taken as a form the consciousness of the represented ends and means. The active tendency has become, by reason of knowledge, a desire, a love. M

b. Moreover, the knowing ego, being a changing thing, feels its riches escape it in proportion as it acquires them. Present consciousness passes and becomes the past. The ego wishes — and this because of its natural tendency to endure in being — to keep this fleeting object which has become itself. It will bring it back by memory. But an activity must intervene, an activity which sometimes is an effort to complete this poor mutilated ego, by reconstituting its broken unity. This activity is a requisite for the very awareness of the ego and the unity of personality. In the mental illnesses which affect the ego, "that personality or part of personality, which the subject wishes to be one, constitutes the unity of consciousness. The rest remains outside of this unity, because the subject wills to let it remain outside that unity." "Thus the innate tendency to be, impregnated by the knowledge of a present which is vanishing, engenders the action of memory, a mental synthesis wherein all desires are nourished. The basis of love is to know a second time.

There is, however, *a difficulty* which remains. To know is to contemplate, to see. Is this not then a repose, an immobility, whereas to act is at the same time to modify the object and be modified in turn? How does one unite these contraries? — We

M Summa Theol., Ia pars, q. 81, a. I, lays down the principle :
 * Quamlibet formam sequitur aliqua inclinatio." It applies it to two areas, that of non-conscious beings and that of conscious beings. The latter, beyond their natural form, possess, through knowledge, the form of the objects they know. Thus there are two different degrees of inclination : natural appetite, and that appetite which follows intellectual or sensible knowledge and is superior to natural appetite.

"Translated quotation from Hamblin, *Essai*, p. 442.

have only to recall that the ego is a movement and that movement is precisely the union of contraries. The contrariety of knowing and acting is, perhaps, that which is most useful to us in distinguishing *rhythms* and acts in the ego. A complete rhythm — which implies all that is essential in movement — is a movement included between two relative rests (for in joining this movement to other anterior and posterior rhythms, the entire intermediary rhythm is movement and contains nothing of the purely immobile). In psychological movement, action springs from a first knowledge which is not yet animated with the action's dynamism (it is in a state of relative repose in respect to the consequent action), and it will terminate in a second knowledge, of an affective type, wherein movement makes place for repose in the tendency (N.B., in the tendency, and not the whole ego). The ego thus moves itself, from a knowledge wherein the object is in relation to an unsatisfied tendency, to a knowledge which experiences the satisfaction of possessing the object which action has attained. If knowledge is static, it is not in its link with action, but in its link with its object. Moreover, this static characteristic simply expresses the immutable quality of truth. It does not imply the exclusion of discursive reason nor progress in knowledge. On the contrary, and here again the unity of life is rather obvious, since a simple reflection on acquired truths will quickly show their imperfection, their lack of integral adequacy to objects. From this there rises a new desire, a scientific or philosophical activity, which has for its aim the embracing of the object *in its entirety*, a desire which leads ultimately to the desire for the Vision of God.

To sum up : *active love has its origin* in knowledge which awakens in consciousness a natural tendency. Active love is sustained by the unsatisfied state of this tendency, is exercised in the construction of an object adapted to this tendency, and finishes finally in *affective love*, wherein knowledge has the essential role of appreciating the accord between the acquired object and the need subjectively experienced.

But, insofar as the actual possession of the good remains inferior to the tendencies, pleasure remains imperfect and

reinforces desire, the motive of action. Thus affection, turning the attention of the subject to act, makes the act more intense and often more efficacious. »• This collaboration of affectivity with act is even a constant factor, as paradoxical as it seems (pleasure supposes the possession of a good, action seeks a good which is not possessed), but the paradox is explained if the pleasure is imperfect. Often the good for which we are searching has a successive existence. •' The pleasure which I experience in the first verses of a poem makes me desire to read on. Thus it is that we acquire little by little a good which is durable in itself, as is the case with science and virtue. Finally, the memory of a past pleasure can cause the desire to experience it again, if, for example, the subject finds himself in a frame of mind similar to that wherein he first experienced this pleasure. The picture of a chicken is enough to make the digestive glands of a hungry man begin to operate, but not those of a man who is full. In the same way, affectivity which, of itself, supposes an acquired state, remains linked, as does knowledge, to the dynamism of action. (This observation has great significance for moral philosophy.) ••

Psychological life, even in its diversity, shows itself to be basically one. Let us continue to analyze this diversity by approaching closer and closer to the " formalities " of the object.

E. Sensory acts and intellectual ones are specifically distinct.

1. THE FACT OF THE DISTINCTION I

a. is obvious to common sense. Man believes himself superior to the animal; he classifies himself as a species apart.

» *Summa Theol.*, I-II q. 33, a. 4. Pleasure perfects action in two ways : (1) in the manner of an end, by adding a good to him who performs the action; (2) "ex parte causae agentis," but only indirectly "in quantum scilicet agens, quia delectatur in sua actione, vehementius attendit ad ipsam et diligentius eam operatur." Refer to the Moral of Aristotle (bk. 10. ch. 5). according to which, " delectationes adaugent proprias operationes et impediunt extraneas. "

* *Summa Theol.*, I-II q. 33, a. 2.

•• James Royce, S. J., *Afan and His Nature*, pp. 162-163.

Now it seems that it is thought which marks for him the line of demarcation, since the animal does not think. On the other hand, no one denies that sensation and memory exist in the animal. If thought is a specific trait in man, if sensation belongs to animals, common sense feels it must distinguish one specifically from the other.

b. *Descriptive psychology*, by its analysis, transforms this presumption into a proof.

1) It compares man with animal and observes in the first the union of sensation and thought, while in the latter, it observes sensation to the exclusion of thought.

a) The animal has a life which is purely corporeal. • That which interests him, in his transitory associations (migrations of fish, birds, etc.), in his permanent associations (bees, ants, etc.), in his kind (facts and instincts relative to reproduction), is solely organic life. Man, on the contrary, has a life which infinitely goes beyond the limits of matter. He has a *conceptual* language, which he employs with the intention of signifying. He has *scientific* ambitions, *esthetic* tastes, a *moral* and a *religious* life. These forms of life suppose a type of knowledge which goes beyond matter, a thought which is other than sensation.

b) Even in his corporeal life, man acts in a way that greatly differs from that of an animal. w The latter resolves problems of adaptation by reason of its instincts, by solutions which are all the more rigid as his instincts are more perfect. Animals of the same species *all* react in the same way in the same circumstances. The rare differences in their behavior come from individual conditions, which may be innate (mutations), acquired (training, memory), or purely transitory (sickness, state of hunger or of repletion); otherwise, their reactions are *immutable* in time.01

** J. Fr ö bes, *Psychologia Speculativa* (Freiburg i. Br. : Herder, 1927), Tomus I, pp. 38-53.

« Herman Re it h, C. S. C., *An Introduction to Philosophical Psychology* (Englewood Cliffs, N. J. : Prentice-Hall, 4th printing, 1959), pp. 106-107.

“ *Ibid.*, p. 107.

On the contrary, man is endowed with an *autonomous junction of adaptation*, which is aware of problems as problems, views their solution as an end and pursues it by an indefinitely varied choice of means. Nourishment, clothing, locomotion, and instruments designed to procure these, are problems which are solved in different ways by different individuals, or by one man following his own whim, caprice or will. And — what is not less remarkable — these solutions have been invented by a work of intelligence, which is sometimes prodigious, and involves the accumulated effort of past generations. Thus science has completely changed the material organization of life in our days. *Liberty* in the choice of solutions, and evident historical *progress* in their discovery, are two characteristics proper to man which markedly separate him from the animal in the corporeal acts of life itself. We must, therefore, recognize a force in the psychological life of man which is very different from that of animal life, ruled as it is by sensation.

2) MAN AS HE IS IN HIMSELF is also the object of the study of psychology. The study of his functions obliges it to condemn both empiricism and idealism. The first identifies idea with image; the second sees in the image only a "thought which is more developed and more concrete, as opposed to a thought which is more involved and more abstract." * For one, everything is image; for the other, everything is thought. Psychology, on the other hand, recognizes the originality of thought in reference to image.

a) the idea is not a simple image (*Berkeley*), nor an association of images ticketed with a single name (the associationism and nominalism of *Taine*), because :

(1) I can either limit myself to an image or know something about this image; *the idea is what I know about it*. I see a new object, and I ask myself : What is it? In posing this question to myself, I am looking for an idea, the idea which will be my first knowledge of this image.

(2) the idea and the image are independently variable,

° Quotation taken from Hamelin, *Essai*, p. 388.

(a) firstly, *in quantity*. To have a plurality of images is not synonymous with having a plurality of ideas. The proof is to be found in the facts of psychological development. Infancy is rich in images yet poor in ideas. The ordinary development of a human implies a progressive decrease in imagination and a parallel increase in thought. Another proof can be found in the effect of the movies, which is the method par excellence to bombard our attention with images, but it is not necessarily the method which provokes any thought. Thought and image actually seem to vary in an inverse ratio.

(b) image and idea are completely disproportionate *in quality also*; "we think well beyond the range of an image; against an idea of one hundred thousand dollars, we have the image of four or five cents." The researches of Alfred Binet and those of the Wurzburg school have not demonstrated the existence of a thought without an image, but at least they have solidly proven the irreducibility of one to the other. «

In particular, the sensory quality proper to an image does not at all involve the same quality in the idea of an identical object. As a matter of fact, images which are qualitatively different can easily condition ideas which are qualitatively identical. Thus a man born blind can know a geometry linked to images which are purely tactile, whereas one with sight has the same geometry, which is nevertheless linked primarily to visual images, which are very different from tactile ones. Thus *the idea is indifferent to its imagery*.

(c) finally, *clarity* and *distinction* can be absent from the image and present in the highest degree in an idea, and the inverse may be equally true. From this point of view compare the image with the idea of a ten thousand sided figure.

(3) The object of an idea can be completely *unimaginable*. Can we have an image of goodness, justice, science, God, nothingness, etc? M

« James Royce, S. J., *Man and His Nature*, pp. 98-100.

Ibid., pp. 93-94-

b) judgment is not reducible to a pure association of images.

(1) Firstly, images are associated without judgment.... Dreams and reveries are only associations, a succession of images, spectacles for my internal senses. Where is there any judgment, when I am limited to seeing one movement follow another? Moreover, many questions which are asked realize the association of what will be the subject and the predicate of the answer. Though the answer be lacking at the moment of the question, when it is given, it will be given in the form of judgment. One can ask : Is the door open? This question is association, but it is not judgment. To judge is to think either yes or no.

(2) Juxtaposition is all there is to association. Those things which are associated remain different. To judge, on the contrary, is to *identify* two thoughts with one another. Such is the meaning of yes or of a copula. On the other hand, no is not the absence of yes. Its function is simply to reject the yes, and, therefore, supposes an identity of two terms taken as an hypothesis. A unification of states is operating in every judgment. Association only multiplies them.

(3) Again, to judge is to predicate. Now a predicate is always something other than an image. With what is an image identical, unless with itself? If, therefore, to judge is to identify the subject with the predicate, it must very well be because the two terms are not opposed to each other as two images always are. It must be that they can *compenétre* each other. The predicate-idea, because it is apt to be fused with the subject, is therefore not an image. We shall see what confers this aptitude on it, by pointing out its abstract and universal character (*Quidditas abstracta*).

(4) To judge is to think truly or falsely. Now truth supposes that the mind is not by its nature forced to represent an object with a complete disregard for the object itself, but that the mind knows the object by consciously affirming a relationship of identity between this knowledge and its object. The association of images pays no heed to truth. At the most, it

has a grasp of the word truth, but it is ignorant of its meaning. “

(5) *The object of judgment can be completely unimaginable.* Thus “Non-Euclidcan geometries are not *absurd*; God is the *Creator*” these predicates are not merely words. They have a sense, but they tell us nothing which is of a sensory nature.

c) “A fortiori,” reasoning is not to be reduced to a more or less complicated scaffolding of associations. “A fortiori,” since he who reasons cannot do so without judging. But especially because :

(1) Reasoning is to think by virtue of a logical determinism. In order that the antecedent here involve the consequent, and the premises the conclusion, it is absolutely necessary that this antecedent should be known, and that the why of the passage to the conclusion be revealed in that knowledge. The “why” which we oppose to an unlooked-for affirmation, and the “because” which answers it, are manifestations of that law. There is nothing like this in association. In association, the laws are very different, and they are reducible chiefly to the law of contiguity, which is most fundamental and which in its essence is no more than the law of habit.

(2) The grasping of this why, which is the very soul of reasoning, is in no way sensory, imaginative or material. It is essentially the identity of the conclusion with the premises. Now this identification is completely immaterial, since it is a judgment drawn from other judgments.

Thus psychological science gives a solid basis to and justifies the common persuasion of mankind. In a word, psychological science gives this common persuasion an objective certitude. There is in man a psychological life that is richer than that of the animal. An animal has images, but no thoughts at all. Man has a thought which infinitely transcends his images. Thus man is specified by his thought. He is an animal who thinks. This is a specification which is derived from the irreducible

** Hubert Gruender, S. J., *Experimental Psychology* (Milwaukee : Bruce, 1932). pp. 286-300, 245-252.

distinction between images and intelligence. But what is this distinction due to?

To the diversity of the objects which are proper to sensation and thought.

2. THE REASON FOR THIS DISTINCTION

a. sensation is diversified in numerous kinds. Sensory acts essentially imply knowledge. The Cartesians have denied this, but that was because they were thinking of a perfect knowledge, which knows itself as identical with the object and is called judgment. Here, there is no judgment actually, but nevertheless, there is knowledge, although it is ignorant of itself. It is on this knowledge that sensory desires and emotions are built. Thus a whole family of acts is constituted. Its prototype species is sensation in the strict sense, for it is that which furnishes all the others their general or "material" object. Its proper or "formal" object is closely linked to theirs. St. Thomas has expressed their common traits, their "family" traits, by saying: The sensible object is *the corporeal individual*, i.e., material or extended. Speaking of *sight* in particular, he says: "Visus nullo modo potest *in abstractiones* cognoscere id quod in concretionem cognoscit; nullo enim modo potest percipere *naturam nisi ui hanc*." He says of every sensory function: "Objectum cuiuslibet sensitivae potentiae est forma prout in materia corporali existit; et quia huiusmodi materia est individuationis principium, ideo omnis potentia sensitivae partis est *cognoscitiva particularium tantum*." •• Images are no exception: "... a materia *individuals* quam repraesentant phantasmata," and again: "Phantasmata, cum sint *similitudines individuorum*...." Let us verify this affirmation of the functions of knowledge; it will be done by the very ••

•• "Sight can in no way know abstractly that which it sees in the concrete: in no way can it perceive nature except as this thing." *Summa Theologiae*, I^a pars. q. 12, a. 4. ad 3^{am}. • "The object of any sensitive power is the form as it exists in corporeal matter, and because matter is the principle of individuation, every power in the sensitive part of man knows only particular things." *Summa Theol.*, I^a pars., q. 85, a. 1, ad 3^{am}.

fact of desires and affections which find their object only by reason of knowledge.

1) *sensation*, in the strict sense, makes us know qualities, colors, sounds, etc., but in a way so intimately connected with extension that only abstraction can separate them. No *color* or luminosity is sensed except as "informing" a surface. An unextended point is visible only with and through the surface which it breaks. The natural link of *tactile* qualities to extension can not be denied, except by those entertaining the prejudices of an anti-experimentalist empiricism. *7 As for *sounds, odors, and savors*, they undoubtedly include a perception of extension. In my primitive experience, there is no distinction between extension which is external (that of bodies), and that which is internal (that of my body). Extension is simultaneously and indistinguishably mine and that of the non-ego, and this must be said of visual and tactile extension as well. Primitive experiences are each an ensemble of objective and subjective extension operating in the organs. It is only little by little that I begin to discern two zones in sensed extension; then I attribute colors, resistances, sounds, odors, and savors to exterior objects, and I place them in relation to my organs, becoming aware of them by the attention which I focus on their position in relation to me. In doing this I have only discerned certain relations of sensible qualities to my organs, and of these qualities among themselves. I have not had to construct these relations first. The most constant of these relations is assuredly that of extension (or mutual exteriority). Thus no sensation unveils a sensible quality to me without unveiling its relation to extension. Unextended sensation is found only in the writings of empiricists. No human consciousness experiences it.

If we had to reason here, the conclusion would be the same—The immediate excitant of every sensation, is actually a

♦ Baudin, *Psychologie*, pp. 195-197. Baudin here refers to Berkeley, Mill, Bain, Spencer. Wundt and Taine, who all held that the notion of extension was not a primary datum of sensation, holding that our first sensations are unextended and have no other characteristics than their quality and intensity.

movement or a state of *extension*. The nervous impression is again a modification of *extension*, that of the peripheral organ, the conducting nerve and the cerebral center. Isn't it natural that an intuitive knowledge, which is thus conditioned, should have for its essential object, *extension itself*!

INDIVIDUAL OBJECT The error of the empiricists is, nevertheless, explainable, since they have understood *extension in an abstract sense*, that of the geometricians. On the contrary, the sensed extension is complete!}' *concrete* and *i n d i v i d u a l*. The individuality of which we are speaking — it goes without saying — is not that of a substance, or that which characterizes "an essence apt for existence by itself." It is that which is proper to extension, that which comes from the limits of extension, i.e., the qualitative differences which isolate its parts, especially in the independent displacement of certain of its parts. In a word, *individual extension is that which encloses a contour*, a line or a surface. Individuality here is only the position on this or that side of a particular line or a particular surface.

To grasp the individuality of every sensible object, it suffices to be aware that each quality sensed is directly *l o c a l i z e d*. This is sufficient, for *to localize is to relate to spatial limits*, and, therefore, above all, to grasp limits in extension.

The empiricist *w i l l o b j e c t* : sensation in a pure state is not localized. It becomes so by a mental elaboration. — This is to forget to give materials to a builder so that he can make something. I agree that a mental elaboration is necessary in order *to make precisions, to appreciate and to measure* the local relations of sensed qualities. I do not know by sensation alone *w h a t* distance separates this circular object which is called the moon from a point called the North Star, or from this mass which is my body. However, I *s e n s e t h a t* there is a distance, although I perceive it mingled with a multitude of other distances, those of all the differing qualities which constitute at this moment my field of vision.

Here is a proof that sensation grasps the limits of extension. Sensation is sufficient to enable me to know the *movement of*

qualities, whether it be their displacement or their alteration. The first case is that of a *variation in place* (this accumulation of motley spots, the cat, draws away from this growling mass, the dog); the second is that of a *succession of qualities* having the same *localization* (the dog first was growling, and now he begins to bark). Thus there is a derived localization, i.e., secondary, wherein the intelligence plays a role, which is sometimes a very important one (e.g., astronomical measures). But *there is a primitive localization*, indistinct, merely felt.

Thus, there is first a constant experience of sensation which affirms it. Because the empiricist through abstraction distorts the vital play of sensation, he no longer finds in it any other object than pure quality. Lived sensation is always that of a quality in some present extension.

An easy reflection will also confirm this. To sense extension, is to be aware of parts *outside of parts*. Individualizing localization demands *no more than limits*. Now these are present in every sensation. Touch and taste have extremely narrow limits. The senses of smell and hearing have coverings enclosing their sensory field. Sight has its horizon and its angle of vision, without even considering the variations between its highest sensibility (the yellow spot) and its lowest sensibility (the blind point), which establish limits even within the sensory field. Besides these limits which are inherent in every sensation, there are limits constituted by the indefinite variations attributable to individual organic conditions which affect sensible qualities themselves.

We can conclude : the object of sensation is always concretely or *individually extended*.

2) the imagination has the same object as sensation, obtained as through a second drawing of sensed objects. It *reproduces* sensations in less vivid forms which are often feeble and fragmentary portions of former sensations. In dreams and reveries, imagination is often *creative*, and assembles preexistent materials in original sequences and new syntheses. But it leaves them their individualized extension; in short, it only modifies the limits and the juxtapositions of extension. As to

the higher forms of scientific, moral and esthetic invention, these are evidently not the work of imagination alone. They are animated by a life which is properly human and in no way reductively animal. Hence, one cannot draw any objections concerning the object of images from the creative forms of human invention.

3) perception is essential)' a sensory nucleus, ordinarily surrounded with a halo of images. Here, man, differing from animals, incorporates abstract ideas into his field of sensory awareness. Despite this, every perception has as its object an individual extension, grasped by sensation. The object perceived is, first of all, *an extension*, and it would not be an "object" if it were not *finite* and limited.

4) memories must be divided into two groups. To recognize a particular system of philosophy' in the writing of a journalist is a question of intellectual memory. However, we also recognize *recalled images* and *relived perceptions*. This is a question of sensible memory'. Its object is the same as that of images and perceptions, at the same time individual and extended.

5) animal evaluations, which the psychological analysis of instinct reveals, do not go beyond the corporeal individual. They are concerned with *the physical acts* of the animal. They "judge" *§ them in relation to *objects which are exclusively corporeal*, ends or means of actions, whether sensed or imagined. Thus the *sight* of a shoot of straw stirs a bird to pick it up and *the image* of a future nest involves the placing of the straw within the supports. Nothing is revealed in these objects, except what is concrete and material.**

** Animal instinct is governed in its operation on its environment. But how? Two extreme tendencies approximate an answer. One concerns actions directed by conscious thought of an end and free choice of the means. The other concerns itself with the mechanical response given to influences received through self-regulating machines. The truth lies between these two extreme analyses of instinct. The animal action is regulated not on things themselves, but objects, i.e., on the things insofar as they are known. This knowledge remains in the sensory order, but involves a comparison between the object and the subject.

' corollary. All these types of knowledge condition *desires* and *affections*. But love, in its two forms, can have no other fundamental object than that of its correlative knowledge. Thus love, whether active or affective, which originates with sensitive knowledge, is *always a sensory love* itself. We can remark that the activity, here, has only one form, which is always of a technical kind. The technique of an animal is that of instinct. There is neither art nor morality here, since nature acts in him without any consciousness of a relation, completely immaterial of means to an end.

. Sensitive life is therefore turned towards an *individual object* which is extended. This explains the limited scope of instinct, as well as its rigid determinism, which is similar to mechanism in matter.

, b. thought has a much more ample object, which explains the suppleness of human comportment in contrast to the rigidity of animal instinct. Let us first delve into the extent of this object, to what *can thought apply itself*, and in what way does it do this?

1) ITS INTEGRAL OR ADEQUATE OBJECT, its generic Or common object, is being in general, whether extended or not, whether *material*, i.e., essentially dependent on matter, or *immaterial*, i.e., not essentially dependent on matter, but either accidental}' or not at all; whether *existent* or *possible*, a *thing* (tree, man) or a *value* (good, true, etc.).

a) Ever}' *immaterial* as well as material being is the object of thought. In fact :

. (1) Wheresoever I have found *the non-imaginable* as object, I have found the immaterial, for the extended and everything

both grasped as they are in their concrete state, a " sensible judgment, " a judgment of the senses, closely related to that which is harbored in estimations on pleasure and pain.

See A. Valen̄sin, *Balthazar*, pp. 64-74. " Picture a sleep-walker : he acts out what he is dreaming without knowing that he is doing so and without even knowing that he is dreaming. .Such is the soul of brutes. " (P. 70).

See J. Fk̄oues, *Psychologies Speculativa*, Tomus I, pp. 173-177: J. Royce,-S; J., .Wan and *His Nature*, pp. 82-84: A. Thonnard, *Priais de Philosophie*, pp. 967-974.

which necessarily depends on it is the very object of the imagination. Now, I have found that all forms of thought can attain non-imaginable objects, whether they are *beings*, as God and spirit (these two words have a meaning, a mental object), or *relations*, or the *nature* of a thing, the *cause* of an existence, the *finality* of an action, the *truth* of a judgment, or the *goodness* or *perfection* of an act.

Now, I very often think of material objects in terms of the above relations, but these relations are thought by me as having *no* necessary *link* with extension, because I think of immaterial objects in terms of these relations as well, e.g., the nature of the *soul*, a *creative* cause, and *moral* perfection. Moreover, I conceive certain of these relations as existing only between immaterial things, for example, the *truth* of universal judgments, wherein there is a question of the identification of the judgment with its universal object (the judgment $2 + 2 = 4$, is true by its adequation with its completely abstract and immaterial object : two added to two). Likewise, the *moral goodness* of a decision results from the completely immaterial agreement between the mental evaluation of a possible act and a moral ideal.

(2) But I also observe in myself a host of ideas whose *object*, although it is material, may nevertheless *essentially imply the immaterial* which I incorporate into it. With any idea which designates a material reality, I can form an idea which is its contradictory : red permits me to think of the non-red, the mobile of the immobile. Now negation or contradiction have nothing to do with extension, yet it is most often useful to be applied to material determinations, and it opens up perspectives for the mind, which are no longer limited to matter. The non-red, the immobile, are not necessarily extended objects. It is certainly true, that in order to arrive at these thoughts, I have followed a way which began in extension, which is the proper object of thought, but in thinking these things, I have broken the bonds which would subject me to the using of extension.

” G. Kluuhtanz, S. J., *The Philosophy of Human Nature*, pp. 164-167.

b) Moreover, all being is the object of intellectual knowledge and is actually known through a relation to each determined being, no matter which determination is being directly considered. It is the act of judgment which guards and entrusts this secret to us : it knows the totality of being in relation to any determined attribute of being.

(1) *All that the mind knows, it knows in relation to being.* Once the complex " subject-predicate " is formed, the judgment avows : This *is* or this *is not*.⁷⁰ Thus it shows that it has for its object all that is thinkable, i.e., everything which is or can be. To say " this is, " one must know being in general, i.e., all being. It is not a question here of the copula, which is limited to expressing this internal assertion, and which can be lacking, but rather a question of the intimate thought of him who judges. This thought always evaluates the " matter " of a judgment (subject-predicate) as true or false, as " being " or " not being. "

(2) Beyond its aptitude for knowing being and judging all being, the judgment, which affirms or denies, manifests itself as already *knowing* all being. When judgment expresses itself in a " Yes " or " No, " there is always an affirmation or a denial. When it thinks explicitly of one attribute or another, it is always all of being which is attained. Actually, to judge is to think directly of a determined attribute, and indirectly of all that is not this attribute. It is to think of all beings together : those which the extension of the attribute embraces in a distinct way, and those which it excludes in a confused way.

In a *negative* judgment, this is very clear : " an atom is not visible, " for example. Here I am directly thinking of the attribute " visible, " but in denying it of the subject, I have a confused notion of the entire group of things in which I implicitly rank the atom. Thus, at one and the same time, I know all the

" In a judgment which is truly thought and therefore belief, I experience what being is : my being which judges the being of that which is judged and the being of their identity in an indissoluble opposition. Not only do I grasp the meaning of being (= a something, an essence), but I claim to know that which being is in its totality, all of existing reality, when I think, " This IS. " *

visible since I exclude the atom from it, and all the invisible of which I know at least that it includes the atom. But all the visible and all the invisible *make up the whole of being*, for the principle of the excluded middle will not allow the hypothesis of a being which could exist between the "Yes" and "No" of visibility. To deny, then, is to know all being in some fashion (extensionally, at least).

The *affirmative* judgment, in its turn, at least implies a negation. In this sense, the widely discussed formula of Spinoza would be true: "Every determination is a negation." The judgment, "The sun is *shining*" includes the judgment, "there is or there can be *things which are not shining*," and it expresses a relation of these things to the sun: "The sun is not among these things." Briefly, each one knows that in making an affirmation he denies its contradictory. Thus each one has an experience of the principle of non-contradiction in every judgment, and even becomes violently aware of it when he hears his opinion placed in doubt or denied. Therefore, to affirm an attribute of a subject is to deny the contradictory attribute of that same subject. It is to know these two attributes at the same time, and by reason of this, to know all being, since the "Yes" and the "No" which are relative to the same determination embrace the totality of being.

To judge, whether by an affirmation or a denial, is certainly to have a knowledge of all of being, of being in general. One has this knowledge by considering a part of being through the positively affirmed attributes, and the other part through the negation of the same characteristics.

Thus the totality of being is known in the simplest of judgments. Certainly this knowledge is only an implied one, and does not exist except in relation to a *particular* being.

Consequently, at the same time that the judgment unveils the infinite extent of the intellectual vision of the "signification of being," it poses a question which leads us to the *proper* object of human judgment, and, through it, of human thought. Actually, what are those positive characteristics, affirmed or denied, which constitute our proper light on being, and are the

indispensable object of every judicative function (evidently we must have something to affirm or deny)? The proper object of human thought can be formed only from characteristics which are common to all the positive predicable characteristics.

2) the proper object, which may be called the specific object, the first or the essential object of human thought, is "THE UNIVERSAL SEEN IN THE SENSIBLE," Í.C., Seen in an individual extension.

The Scholastic formula, "Quidditas abstracta a rebus sensibilibus," embraces these two aspects cited in our definition, and even a third which will be studied further on (Third Question). "Quidditas" is the expression of the notion which answers the question, "Quid est?," and it is that which makes this notion predicable, i.e., it is its non-individual meaning. Thus: 1. *quidditas* designates a *universal* idea, applicable to many; 2. *a rebus sensibilibus*, the *link* between this "universal" and *sensible objects*, a link by reason of which I am able to predicate this universal of them, because I can observe this link and see it; 3. *abstracta* indicates the nature of the operation which allows me to grasp the universal in the sensible, to draw it out from the sensible, as it were, to be considered in itself, and finally to be put back through an attributive judgment. This is abstraction. For the moment we will not concern ourselves with the nature of this operation, but we shall simply consider what will later show us the existence of such a process.

a) we have universal ideas. The universal idea is that which has no strictly individual meaning, which contains only those notes of comprehension which can be common to a number of individuals and belong to each of those individuals in an identical way. Do we have such ideas? We most certainly do.

(1) Their universality is best shown in their *use as predicates in a judgment*. Actually, the same predicate can be truly affirmed of a number of individuals only if its comprehension contains exclusively common characteristics (non-individual). For the presence of one single individual characteristic among its notes would prevent the predication of this idea to any individual who would not be the unique individual possessor

of this characteristic — since predicating consists in identifying the predicate with the subject, and an individual or individual characteristic cannot be identified with any other than itself.

Leaving aside for the moment the case of a perceptive judgment, e. g., this is my hat, the predicate of a proper judgment is applicable not only to one, but to a multitude of subjects taken individually. This is true even when the judgment concerns only one individual; and it is true “a fortiori,” when the subject is any individual of a given species: “this flower has a *special odor*, ” “the Labiatae have a *special odor*. ”

All attributes or predicates of this kind are, therefore, universal ideas.

In brief, we judge. A proper judgment demands for its predicate a universal idea. Therefore, we possess universal ideas.

(2) The analysis of *ideas taken in themselves* shows that their comprehension always embraces notes which are universal. The ideas which are called *general* or strictly universal, e.g., man, flower, triangle, embrace only such notes. The others — called individual — e.g., Napoleon, me, are made up of universal notes which are grouped and ordinarily referred to a concrete datum of sensation: the Emperor, the Corsican; born on..., in the year..., died on..., in the year..., all are universal notes — such a face, such a build, refer to individual sensorial data. To sum up, no human idea can dispense itself in any way from universality.

b) THE PROPER OR formal object of human thought is the universal, because it is the proper object of judgment, which is the only complete expression of thought.

In fact, the *predicate* in the act of judgment, which is an act proper to man alone, is essentially *universal* (see above). There exists no exception, even in regard to perceptive judgments. For judgment is human, different from the cognitive acts of an animal, because that which is predicated is not a simple image, but an individual idea implying always the universal.

Now it is the predicate which manifests the formal object of judgment and not the subject. The predicate is that which is known about the subject, that which makes the subject known to the mind. (It is true that the Scholastics call the logical subject of a judgment the object, but that is in the sense of a "material" object, not a "formal" one.)

Therefore, the formal object of judgment, and consequently of all human thought, is the universal. Judgment knows its subject insofar as a universal idea is predicated of it.

corollary. The intellectual knowledge of the singular is therefore always a derived knowledge, having as its basis knowledge of the universal. Human intelligence, thus, does not know the singular except by a kind of "reflection."

(1) Taken strictly, reflection is that which permits me *to know myself*. To know myself, a previous step is required: I know with a consciousness of knowing, i.e., I judge, I grasp a universal present as a predicate in a subject. It is by a second act that I know myself as judging, and thus it is that by reason of a universal previously known, I know myself. 71

« We must make a distinction between knowing the nature of ego in general and knowing my own proper ego. Only the second type of knowledge is singular. Here St. Thomas is caught between two ideas, that of Aristotle, whose formula is given in the *Summa Theol.*, I pars, q. 87, a. 1: "Unumquodque cognoscibile est secundum quod est in actu et non secundum quod est in potentia, ut dicitur in IX Metaphysicae," and that of St. Augustine, who is quoted in the first "Videtur" of the same article: "Mens scipsam novit per scipsam quoniam est incorporea (*De Trinitate*, I, IX, ch. 3)." The very explicit opposition of these two ideas is found in the *De Veritate*, q. 10, a. 8. St. Thomas accepts both of them in pointing out that the soul, if it is potential in respect to its psychological acts, it nevertheless is actual as form and spirit, and, therefore, intelligible by itself. Nevertheless, it does not for that reason know itself, through itself, except in a confused manner, as a learned man might know what he knows without explicitly thinking about it, like a luminous background against which his successive judgments stand out in relief. For a fuller treatment of this "habitual knowledge," see H. D. Gardeil. *Psychologie*, pp. 127-133; G. PICARD, *La Saisie Immédiate de Dieu*, pp. 12-18.

It seems that the actual knowledge of the ego supposes this habitual knowledge, and that it manifests it to consciousness, because, in a particular judgment, I do not grasp myself as "being this judgment" in an isolated state. I also recognize myself as being something beyond

(2) Again, we may call that a reflection, in a broad sense, which gives me *the idea of this or that corporeal individual*. The idea of Napoleon the First supposes that numerous universal ideas have already been acquired, but these are not enough. This singular idea demands that I link this plurality of universal ideas to a center of unity endowed with a spatio-temporal existence; but such an existence is known only by a relation to sensory experience. Therefore, in every idea of a corporeal individual, I connect the universal with the singular, I pass from the intelligible to the sensible by a kind of inversion of the spontaneous movement of thought. 73

Scotus is opposed to this opinion of St. Thomas. The Scotist doctrine holds for an immediate intellectual grasp of the singular. In order to form a universal idea, according to Scotus, I must first know that from which I derive this idea, and that can only be the singular. — Moreover, experience shows us this. If I see an animal from a distance, I know that there is an individual object there, before I know that it is a cow or a horse. 73

projecting this judgment, as an internal field in which it is exercised, as a unity or a "totality" from which this judgment stands out. That which is clearly distinguished by a progressive deciphering ought to be experienced confusedly from the beginning: "Mens seipsam per seipsam novit, quia tandem in suiipsius cognitionem pervenit, licet per actum suum" (S. Th., I^o pars, q. 87, I, ad 2^o). As to this act, it is not known as first, but by reason of that which is grasped as being "in rebus materialibus" (S. Th., I^o pars, q. 87, a. 3, ad 1^o). Manifestly, St. Thomas subordinates Augustinian spiritualism to Aristotelian hylomorphism. The soul is spirit, but it is first of all a substantial form and secondarily it knows itself, its proper object being outside itself "in rebus materialibus." The same doctrine is found in the S. C. G., I^o III, ch. 46.

"Sec Maquart, *Elementa Philosophiae*, II, pp. 403-408; *Summa Theol.*, I^o pars, q. 86, a. 1; *De Veritate*, q. 10, a. 5.

Nevertheless, the turning of the universal to the singular is the general law of human thought. The latter perceives an idea only by looking towards images "convertendo se ad phantasmata" (S. Th., I, 84, 7). Instead of turning to the very content of the idea (the universal), the attention turns principally to its material support. This would then be the singular which would be signified through the idea (as existing, if the support is sensation; as possible, if the support is an image).

"Duns Scotus, *Opus Oxon.*, I, d. 3, Q. 2, Nr. 24.

These two reasons seem insufficient to establish what Scotus intends them to do. As to the first : sensation or memory are actuali}' sufficient to furnish me with single objects, wherein the intellect can find the universal which interests it. Why then should the intelligence be able to find the universal only after having known the singular in its very singularity? As to the second reason we do not see experience as bolstering Scotus' opinion, and we must say that it is the sensation in experience which knows the individual existence of corporeal objects *directly*. Intellectual consciousness of the sensation thus furnishes a knowledge of the existence of the individual object sensed, but it does this *indirectly*. That which the intellect knows directly from experience is that this object is one among others, either an animal, or a certain kind of animal — something which is always of a universal character.

The difference between Scotus and St. Thomas would seem to be more verbal than real. Now, the assertion that the first object of the human intellect is the singular is capable of being understood in two ways. 1. "First" can have a *chronological sense*, and in this sense, it is a reference to the "material" object. The formula would then mean : The realities which I know before all others are individuals, whether corporeal or not. 2. "First" can have an *ontological sense*, and thus will refer to the object which is called "formal" or proper. The formula then would express the following : The determinations (forms) by which I know objects in themselves and through which I know other things are stricti}' individual determinations.

St. Thomas would subscribe to the first sense of the formula, and in this sense would be in agreement with Scotus : "Materialiter loquendo, prius cognoscit (intellectus) particulare... cognitione confusa." ⁷⁴ However, St. Thomas rejects the second sense. Scotus, on the contrary, makes the second sense a natural consequence of the first, confusing material object with the formal object by seeing both of them in *every actual*

singular existence. H St. Thomas, however, makes a distinction : That which the intellect grasps first and directly, in the ontological sense, is the universal, but it grasps it first in the singular in a chronological sense. *The first idea is universal; but it is applied only to the singular*, and, moreover, only to the material singular.

In other words :

c) *The universal* grasped primitively in the sensible, here is the proper object of the human intellect. 70 In fact :

(1) *Thought*, which grasps the universal, *depends on physiological conditions* and, in particular, on the nerves. It is interrupted by sleep or fainting, and hindered by diseases and transitory poisonings of the nervous system. Now these conditions are *directly those of sensitive knowledge*, sensation and image. They are conditions of thought only indirectly, i.e., insofar as thought, the grasp of the universal depends in some way on sensation or the image. One should not see here the direct conditions of thought, unless he confuses thought with image. But in what way does thought depend on image? In this, that it finds its materials in the very object of sensation. In fact :

(2) *Sensation is the indispensable purveyor of the comprehension of the universal idea.* The only mistake of empiricism, here, is to make of a necessary condition a sufficient one, by reducing the originality of an idea to nothing.

” Such at least has been the traditional interpretation. E. Gilson thinks this interpretation to be faulty. He writes : ” Scotus does not agree with us ...in any way, for we accept no intellectual intuition of singularity as such ” (p. 546), and he adds : ” The singularity of a nature does not move our intellect, it accompanies the nature which moves the intellect through the image, and if we know, by undergoing the movement of the image, that our knowledge is the intuition of an existent, our intellect can only know the nature abstractly, without grasping the *hoc ut hoc* ” (p. 548). English translation of quotation from *Jean Duns Scot.*

” *Summa Theol.*, 1^a pars, q. 85, a. 1. Here St. Thomas proceeds in a deductive fashion, supposing that the hylomorphic structure of man is already known. In articles 6, 7, 8 of the preceding question, he proceeds inductively and historically, where the indispensable experimental foundations are revealed.

(a) Those who have always lacked a type of sensation, e.g., those born blind, are incapable of forming an idea of the ■corresponding sensible which they lack, as is the case of color in those born blind.

(b) *In order to form the idea of a material reality*, it is natural for us to have recourse to sensation or images. A simple drawing is often more useful than a long description. To evoke the idea of a machine or an organism, nothing is better than a look at its movement. In order to make us understand an abstract idea, a concrete example, a story, a fable, and even play have a major role in our understanding, even though they are addressed directly to our imaginations.

(c) *In order to form an idea of an immaterial object*, we must first have an idea of a sensible object. I have an idea of *myself* and my psychological acts only by a reflection, which has as its starting point the knowledge of sensible objects. I have no idea of *God, soul or spirit*, except through relations which I always remark in the sensible. The soul is the *cause of life*, and I know this life through sensation, and it is again through sensation that I have an experience with the relation of causality; spirit is the *living* which does not depend on extension; God is *The Being, The Living, The uncaused spirit* (now I do not know what it is to cause or to be caused, unless I have experienced it in both sensation and consciousness).

Thus the primitive nucleus of the comprehension of universal ideas is grasped in sensation. We may break down the definition of any idea whatsoever, by the process of defining all its parts, yet we must always arrive at some indefinable datum, which is primitive, and which is furnished by *sensible intuition or that which supposes it* (as is the case in the data of consciousness). It is true that the intellect fashions syntheses, but it needs materials, and it is in the sensible that it finds them.

(3) *Judgment and reasoning*, in their manner, manifest this sensory starting point for thought. To what are they applied in the first place, except to sensible things? The child is first interested only in these things. They dominate empirical thought, acquired through experience, which bears principally

on the sensible, and is oriented towards action, which is exercised on the sensible. Finally, sciences and philosophies themselves find their initial object in sensible things, which is evident from their history, as well as from the study of the fundamental concepts which they employ. ”

CONCLUSIONS

(a) Thus *the distinction* between sensation and thought and that between man and animal, is found to be *justified*. Sensation, having as its object individual extension, is necessarily limited to that which is individual, localized, and determined in concrete extension. It engenders interests which are exclusively oriented towards corporeal life, and it is the foundation of the narrow mechanism of instinct. Thought, on the contrary, having as its formal object the universal, is not restrained to any particular kind of being, but can attain all being, whatever it may be. Hence the infinite variety in free choice and in invention.

(b) Nevertheless, and because of its need of experience, human thought attains being only in the measure and according to the order which its natural starting point — the sensible — imposes on it. It is possible that thought can be confronted with mysteries which are naturally incomprehensible for it, because of the lack of proportion between the sensible and certain immaterial realities. Nevertheless, these mysteries are thinkable if they are supernaturally revealed to thought. It is necessary that thought find *obscurities* even in the knowledge of those immaterial realities which are the closest to experience, since it finds its proper object only in the sensible, and does not go beyond that limit, except by way of negation and

” Translated quotation from L. de Broglie, *Continu et Discontinu en Physique Moderne* (Paris, 1941) : ” To sum up, we can think only with the aid of images extracted from our sense intuition. ” Hence, despite the truth of mathematical abstractions, we are forced to have recourse to concrete representations, e.g., atomic models. Thus ” it is possible simultaneously to give their just due to the abstracts, which, in this controversy (opposing the abstract to the concrete) are right, and to the intuitives, without which progress would often have been difficult and sometimes impossible. ” p. 105.

analogy. The sole exception to this is the case of the soul, whose consciousness allows us to form a proper notion of it.

(c) Knowledge brings love, and furnishes love with its object. A specific distinction between sensible and intellectual knowledge therefore involves a specific distinction between sensible and intellectual love. There are desires which are based on sensation, images, etc., and there are those which are based on universal ideas. Likewise, there are sensible pleasures and pains, and there are intellectual joys and sadnesses. Therefore, there are two distinct affectivities and not one, as the peripheral theory of emotion would have us believe (W. James, *Lange*). * Common sense is right in not confusing the feelings of the most faithful dog with those which an ideal places in the heart of a man.

3. the vital union of sensation and thought, however, furnishes some excuse for this empiricism.

This union is apparent, above all, in the intellect's grasp of the *universal in the sensible*, as well as in the natural tendency of sensation to put thought into action. From this union in knowledge there ought to result, both *in action and in emotion*, a *similar union* between the sensible and the intellectual.

In this way, the ego is never pure sensation or pure thought, but always sensing and thinking at the same time. And as it is never pure knowing, it knows, it desires, it feels as a whole, and this simultaneously in relation to the sensible and the intelligible.

In considering the diverse qualities of the ego isolated from one another, we do not wish to separate them, but rather hope that we will better understand the ego's moving complexity, and be in a better position to discover its nature. Already an

* See E. Baudin, pp. 506-510, *Psychologie*, where he appears to identify all forms of sensibility. From even a purely descriptive point of view, this would be inexact. "We cannot judge the representative element as being negligible," writes Cuvillier (*Psychologie*, p. 258). *A fortiori*, we cannot admit their identity in a metaphysical explanation. The root of human affectivity remains twofold, despite its functional unity.

important conclusion begins to appear : the ego is simultaneously sensing and thinking, matter and spirit.

F. Matter and spirit are actually the characteristics of sensation and thought.

1. *sensing* is a *material* act, in the sense that it *depends intrinsically* on matter, i.e., on extension, for sensation is impossible without an object, and that object is essentially material and extended. The essential dependence of the act in relation to its object is the only way of recognizing that it is correlative to it. Idealism attempts to assure us of this correlation in another way, by making *the object depend on the subject*. But this manner is *unacceptable*, because it misunderstands the "otherness," the independence of the object in relation to the subject, and, consequently, it falsifies the notions of truth and knowledge.

2. *thinking*, on the contrary, is a *strictly immaterial* or *spiritual* act, in the sense that it does not essentially depend on extension.

a. the formal object, the universal, however, is found only in the sensible. But this dependence is accidental or extrinsic, not essential and intrinsic. This dependence *concerns the acquisition of an idea, not its object*. Thought finds this object in the sensible, but it is not the sensible itself, i.e., an individual extension, it is the universal. Now, the universal is thought without any *necessary* link with individual extension (matter), and in precisely such a way that it does not contain in it any individual note, insofar as it is what it is, universal. Thus the universal is essentially immaterial.

An act is specified by its formal object. It depends essentially on it, and on it alone, because its whole reality is in relation to it. Thought is thus specified by the universal (in man, be it understood), and is therefore as essentially immaterial as the universal is.

b. the integral object of thought shows that its dependence on matter is purely accidental or relative, and in no way essential.

Actually, a knowledge, which, by hypothesis, would be essentially dependent on matter, could conceive no object which would be strictly immaterial.

Now thought conceives through negation, objects from which all materiality is excluded, c.g., God and pure spirits. Therefore, it does not essentially depend on matter.

This argument takes a more general *critical form* and even a greater force, when we consider *the judgment*, which is the expression "par excellence" of thought. Every judgment actually implies the knowledge of a relation which is completely immaterial, the relation of truth.

The same argument takes a *psychological form*, when we turn our attention to the fact that by *consciousness* man *reflects* on his acts. Psychological acts are not extended even when their object is. To be aware of an immanent act is thus the mark of a power of knowledge which can attain the immaterial. This argument can become particularized by considering *moral* and *esthetic* consciousness. It is no longer the judgment as such, it is its special object, c.g., the Good, the Beautiful, which testifies to the immateriality of the act which appreciates it. Whoever makes a judgment about religion, merit, justice, honor, ugliness, harmony..., by the same token, asserts the existence of a mind which is independent of matter and irreducible to extension and its proper qualities. "

C. THE DESIRE WHICH IS BASED ON THOUGHT escapes the limits of matter and thus manifests the spirituality of the thought which motivates it.

That desire which is necessarily linked to matter, c.g., instinct, on the one hand is interested only in *concrete corporeal*

* Or we can, with Father Valensin, employ the *apperception of time* and show that it is the act of a being, whose knowledge dominates succession, whose duration escapes its flow. See *Hallhazar*, and especially the dialogue on the soul of brutes.

Or we might use the *idea* that man is made *for his death*, and see there the mark of a spirit, in that it is a conceptualization of that which is never experienced, of that which is beyond all possible experience and against the experienced desire not to die.

realities, and on the other hand is *determined* in its object, and *necessary* in its performance.

There is, however, in man, a desire which stems from thought. This kind of desire is undoubtedly applied to sensible things, but, at the same time, it can not stop there, nor be satisfied there, for it pursues an *Ideal Good*, which is *Moral* and *Beatifying*, which is beyond sensible things. Moreover, this desire can *vary indefinitely* in its application to objects and to the means used to attain these objects, and thus it finds its complete orientation by reason of a *free decision*.

The desire which is based upon thought is, therefore, essentially independent of matter.

We must conclude that the thought upon which such a desire is based is necessarily independent of matter. If not, the effect would be contrary to its cause. Moreover, the study of the relations between thought and love makes us understand that the supreme independence of free desire and the spirituality of the spontaneous movement of the will come from their formal object, and by reason of that, from the nature of the knowledge which furnishes it to them. If knowledge were riveted to matter, the wings of desire would never be able to take us beyond it.

d. joy and sadness, in man, can be separated from the material. As a matter of fact, they function precisely in the measure in which they are penetrated with thought.

Ordinarily, joy and sadness are of an inspiration which is simultaneously sensible and intellectual, and their spirituality seems, at first, to be contestable. Who would deny that the joy of a first cigarette would be especially spiritual, at the memory of disagreeable sensations resented then (cf. the case of St. Monica analyzed by St. Augustine)? *

However, their spirituality breaks forth without any possible protestation in the joy of the martyr going to his

*° See *below* : voluntary desire, the more or less determined states of willing.

“ St. Augustine, *Confessions*, l. IX, ch. 8.

torment, the joy of St. Paul in persecution, the humblest and perhaps most frequent joy, that of a good conscience existing without any sensible recompense, the joy of the scientist in discovery, the joy of knowing, and that joy which is not experienced but hoped for, the joy of seeing God, which embraces all the others.... All these spiritual joys are the fruits of a knowledge in which matter is able to intervene, but not as a limit, nor as an unbreakable chain.

We could multiply particular points of view, but the central point of view which contains all the others is that of the proper object. The universal, insofar as it is able to be predicated by the judgment, makes us know the truth. It makes it possible for us to know all being, even though by negation. It is the condition of our desiring and loving freely any one of the indefinitely multiple means, each of which carries in itself something of the good contained in the universal object of willing. M

We must recognize Descartes' error, when he said : " My ego, i.e., my soul, " as well as that of Gassendi who retorted : " My ego, i.e., my body. " I am body and soul, matter and spirit.

The question of their union, by reason of which I am myself, now confronts us. It can not be resolved if we forget that this unity is the unity of a movement.

I must then study *the metaphysical exigencies* of psychological movement. This means that I must search for the real indispensable conditions of this movement and, particularly, for those which place it in operation, and those which orient it at every moment.

By this I hope to conceive the nature of this immanent activity in a more precise fashion — this immanent activity which is present to my consciousness as the source of my vital animation.

“ Henry J. KOREN, *Introduction to the Philosophy of Animate Nature* (St. Louis : B. Herder, X955), pp. 225-244.

CHAPTER II

THE OPERATIVE POWERS THEIR ACTUATION

Third Question : *How does the action of the ego produce psychological becoming ?*

Third Thesis : Psychological activity :

1. is *not purely active, but passive as well*; since it is also *multiple* and *immanent*, it must therefore be divided into multiple "operative potencies or powers. "
2. *Cognoscitive* powers :
 - a. are all determined by an *impressed species* (species impressa) which comes from the object;
 - b. *with the exception of sensory knowledge*, the act of cognoscitive powers is completed by an *expressed species* (species expressa) which comes from the powers.
3. *Appetitive* powers are either sensible or intellectual :
 - a. the *sensible* appetite is determined necessarily by reason of an object known to the senses as " hoc mihi bonum
 - b. the *intellectual* appetite, i.e., will, is determined necessarily through an object known as the universal good (bonum universale); freely through an object known as a particular good (bonum particulare).
4. Operative powers are *really distinct* from one another, but only *relatively*.

A. The problem of psychological becoming is not only a facet of the *general* problem of becoming, which is a theoretical problem as old as philosophy, but it is also a specifically *human* problem, which creates a kind of anxiety in certain souls, because its solution is of vital importance. This problem is linked to the responsibility which each one feels for his own judgments and decisions. It is also linked to the problem of truth and virtue, the only values upon which human dignity can be based.

We can sum up the practical aspects of the problem in the following questions : In what measure are my acts mine? In what measure are they me, i.e., in what measure do I have a personal existence? — How can I give these acts a maximum reality? How can I be most fully me? How can my existence find its full flowering, its beatitude?⁸³ In order that critique and moral philosophy be enabled to solve these problems, psychology, in its theoretical way, must study becoming, as it is lived and experienced in the inferiority of the ego.

the primary DIFFICULTY, here, is the inherent one of the general problem of becoming. A being which becomes is, at every moment, that which it was not; and having become other, it is nevertheless the same being. Aristotle's solution to Parmenides' problem consists in a twofold affirmation : (1) In all becoming, there is not only being which is in act, but being in potency, incomplete, imperfect being. (2) But the imperfect, the potential, is not completed by itself. In order that it be " actuated " there must be a cause, i.e., a perfect being, distinct from potency.

The specific difficulty with the problem of psychological becoming seems to be insoluble by virtue of these general principles. Actually : (1) the ego is not an ordinary becoming. It is a *becoming which* is caused by itself. The facts of

« Marxism and existentialism pose and attempt to resolve these practical problems. They pay particular attention to the individual man confronting both the world and other men. Marxism tends to bring the individual into a subservience to humanity, while existentialism attempts an absolute liberation of the individual, either through its opposition to others (" Hell is other people," writes Sartre), or by an openness to others (at least in the " Mitsein " of Heidegger).

invention, attention, and especially those of decision, show this to be one of the clearest data of experience. The ego is the active source of its own movement. (2) Moreover, psychological events are due to a *spontaneity*, which is revealed in an analysis of them. Sensations, which are the least free of psychological events, can not be deduced from their physical or even their physiological conditions through the equations of either energy or mechanics. They manifesti}' are involved with an internal source.⁸⁴ Must we, then, renounce any explaining of the ego's becoming by a cause outside itself? If so, then Parmenides would triumph. Temporal duration, like change, would be only an illusion.

The difficulty becomes more acute, because *this becoming is immanent*. By itself, it modifies the ego and nothing else. It gives itself " more being " and not just " other being. " After the consternation of " a being which is that which it was not, " here is the shock of " a being which is more than it is. " We are forced to speak of a being which is identical with non-being, and of a less which is identical with more. Would it not be better to deny the intellectual intuition which grasps the unity of becoming in the ego, and, with Heraclitus, admit the pure diversity of psychological phenomena? If we do, then, once again, everything that would suppose a mental synthesis or psychological organization, i.e., temporal duration, memory, the person, science, morality, all would disappear. This would be the case for even the present moment, the sole reality, since it no longer would have any time to limit it.

Certainly, for him who unifies these characteristics in becoming, there is no contradiction, because they are not predicated of the ego at the same time and in the same respect. However true this may be, we are still dealing with an assertion of becoming and not an explanation of it.

We have not yet presented the most difficult part of the problem. Psychological becoming, as completely immanent as it is, is nevertheless essentially *relative to objects*, to

M See above, D. First Thesis, *Philosophical Psychology*.

"others," and identifies the ego with these objects in every act of knowledge. The knowing ego, insofar as it is immanent, is an *absolute*, and insofar as it is knowing, it is *completely relative*. Insofar as it is that which judges, it is opposed to its object, and insofar as it is the possessor of truth, it is identified with the object.

All philosophies have attempted to explain this becoming of the ego, and their multiple efforts clearly indicate the difficulty inherent in the problem.

1. First of all, we can point out the tendency among some philosophers to have a major preoccupation with giving psychological becoming a cause which explains its change and its identity with objects. *The ego* is, for them, *passive*.

Sometimes it is *the objects* which leave their impressions on it (Epicureanism, empiricism, materialism). M

Sometimes it is *God* who infuses into the mind *innate ideas*, or at least first ideas (Descartes), or who illuminates it by making it contemplate His own Ideas (*vision in God* of Malebranche), through which the agreement between mind and things is assured, since things are, even as the human mind itself, the effects of God's Thought. Spinoza takes this one step further, and the ego becomes no more than one of the innumerable modes of Divine Thought. Pure passivity finishes by destroying the personality of the ego.

Sometimes it is *society* which "rouses (in us) a whole world of ideas and feelings which express it, but which, at the same time, are an integral and immanent part of ourselves," which produces the concept in us, and which invents and wills (Sociological School; Dürkheim, *Formes Élémentaires de la Vie Religieuse*, 1, 2, ch. vm). Here again the activity of personality is replaced by a "collective conscience."

2. Among other philosophies there is still another tendency to safeguard the immanence of the ego and the idea of personality

M Marxism is to be found in this first tendency, because it makes human evolution depend principally on material conditions, and especially economical ones.

at any cost. The ego is therefore active, the cause of its own knowledge and destiny. The urgent problem here is making the ego agree with its objects, and giving a solid basis for the truth of judgment.

Kant believes himself to have resolved this problem by attempting to show that it is the object which depends on the ego and not the inverse. Reason constructs its objects, according to "a priori forms," which are natural to reason and as immutable as it is. Truth, then, is the agreement of theoretical reason with itself. Likewise, the nature of the will lies in the categorical imperative, which creates the moral goodness of particular acts of will, on the sole condition that these have no other motive than itself. The good, then, is the agreement of practical reason with itself.

Idealism wants to go further. It would suppress the "a priori forms" which limit the activity of the ego. Even first principles are no longer immutable. Reason does not belong to a nature nor is it a given activity, rather it is an activity which is built up, an activity which evolves and progresses. The known object is completely produced by the subject, which needs no collaboration with "the thing-in-itself" (Brunschvicg). In Kant, the activity of the ego is partially necessitated; here, it is completely free. In both cases, however, objects are such as the mind makes them to be, and all psychological dependence on the physical or physiological must be or is actually denied.⁸⁴

3. The *Bergsonian* tendency, when confronted with these divergent explanations, is to reject the problem as badly posed. *Psychological becoming does not have to be explained.* On the contrary, it is that which explains all, mind, life and matter. This becoming is certainly a mystery for intelligence, which abstracts, analyzes and thinks in clear and distinct ideas, but

"Here, the existentialism of J. P. Sartre goes in the same direction as that of idealism. The religious man believes that God thinks the essence of a man before creating him, whereas the existentialist holds that in man, and in man alone, existence precedes essence... that man must create his own essence, and this by his free choice. These ideas are expressed by J. P. Sartre in his work. *Existentialism*, pp. 17-21, Eng. trans. B. Frechtman (New York: Philosophical Library, 1947).

this intelligence is not made for knowing, it is fit only for acting. But for intuition, nothing is more lucid than becoming — it is being itself. This vital becoming is essentially] invention, unforsecable newness, free activity; but it is also “ like a wave which mounts only *to be held back* by the descending movement of matter. ” Simultaneously *active* and *passive*, simultaneously both cause and effect, such is the Bergsonian ego.

Against this we have no brief, but even accepting this as fact, we must admit that the ego still poses the following problem, which may be insoluble, but is nevertheless inescapable. In what way is the ego active? In what way is it passive? How can it be simultaneously one and the other? Let us put these questions in another way. The activity of the ego is incessantly oriented in new directions of sensation, thought, emotion, desire and willing. In what way do these directions have the ego as a cause? Moreover, in what way does it receive them, and from whom or what?

Let us first carefully observe the fact upon which the problem is posed.

B. The ego is passive as well as active.

1. *Its activity* does not have to be demonstrated : it is evident. Epiphenomenalism, having pushed the theoretical errors of materialism to the extreme, has denied this. It has denied the activity of the ego under the pretext that the ego can not create energy. The activity which it denies to the ego, is, therefore, an activity which is exercised on the body or material objects outside the body. A few epiphenomenalists will accept the activity of the ego on itself, which is precisely the activity with which we are concerned here, and this activity is undeniable. An event experienced in consciousness can later elicit its recall through memory. As Ribot says : “ Memory becomes a new factor in the psychic life of the individual. ”

Moreover, there is no aspect of the ego, wherein we do not discover some spontaneity, which alone explains its originality with regard to its material conditions. This spontaneity becomes clearer as we move away from the zone of sensation and move

inward to penetrate that which is the ultimate in inferiority, free will.

2. We must, however, reject idealism as flatly as we do empiricism, because it misconstrues *the passivity* which the ego shows in its very activity. The following two points make very little impression on the Idealistic School : first, the ego acquires the acts by which it is determined and enriched little by little; secondly, in order to confer these acts on itself, it needs to *receive in addition* an influence which will complete it.

a. The ego is *receptive* and potential in relation to its acts. It does not possess its acts from the beginning. *None of its acts is innate to it.* In fact :

1) Every psychological act is a *change of the ego*. Now every change brings with it something new, something acquired, for the being which is changed. The innate, on the contrary, is an initial state, antecedent to any change which may occur or be considered in a particular being. Every psychological act is, therefore, acquired by the ego. Not one such act is innate to it. The fact that this act is also produced by the ego and, in a way, immanent to it, can not destroy the necessary force of our contention. Rather it will reinforce it, for that which is produced is obviously something new, something acquired.

2) Must we, then, admit that *the ego* is, in its first moment, a *blank page*, on which nothing is written, and extend the image of "tabula rasa" used by Aristotle in speaking of intelligence, to all psychological functions? Yes, but only in a qualified sense.

Actually, this formula has a purely empirical sense not intended by either Aristotle or St. Thomas. This empirical sense would interpret the ego as non-existent at the beginning, yet as gradually emerging through a construction achieved by an absurd conglomeration of conscious states produced totally by things. We must, on the contrary, suppose an existing ego to pose the question : Is this ego, from the time that it exists, the possessor of determined acts, or is it rather deprived of every act and wholly in potency in regard to all the acts which are

possible to it? The analogy of a wax tablet, whose smooth surface is unmarked by a letter, signifies that *the primitive state of the ego is purely potential*, and that it consists mainly of a hierarchical grouping of tendencies or powers. In this sense the formula is true.

The truth of the formula is revealed through the above analysis, which is valid for every psychological act.

Although this formula cannot be verified directly by experience, it can at least be shown to be true by a sort of extrapolation of experience. *The newly-born* is actually ignorant of everything. He needs to learn everything, even that he exists and that he has a body. On the other hand, *the adult* is linked to infancy by a continuous progress from that state, and can increase his knowledge indefinitely. The state of knowing never appears as being closed. It appears as a state of inexhaustible riches, open to every kind of further development. Does this not reveal the basically potential character of the state of knowing, which always remains indefinitely supple and constantly open?

This potentiality is seen particularly in *the history* of the sciences and of philosophical systems. Postulates and theories follow one another, not by successively putting the previous ones out of existence, but by going beyond them. This is recognized by all the partisans of *human progress*, in whatever field they choose.

At the beginning, must not this potentiality be pure and open, like an immense appetite which no object has yet satisfied? The naive ignorance of an infant must give us the answer. At the beginning, there is no innate knowledge, nor sensation, nor memory (despite the teaching of Plato), and no ideas (despite the teaching of Descartes). *The only innate thing* is an aptitude to receive, an aptitude to know, *a pure potency to the cognitive act*.

That which is true of knowledge is "a fortiori" true of desires and affections, since neither are possible without previous knowledge. The primitive state of the ego is, therefore, a state of potency. For it, to live is to pass from potency to act.

This last point is further verified in the very attitude of the philosophers. Despite the notable divergencies of interpretation found in their metaphysical formulas, all the philosophers are in agreement on this point. If, for Plato, knowledge is the remembering of ideas carried within the self, *reminiscence* is nevertheless necessary to evoke the memory. If, for Descartes, "there is nothing in our ideas which is not innate to the soul," nevertheless, as he states, things give the mind "*the occasion of forming* these ideas at this moment rather than another, by reason of a faculty which is innate." If, for Kant, the "a priori forms" are innate, they are neither sensations nor concepts. They are only *conditions*, such as the natural directions of faculties (either sensibility or understanding).

The following consequences flow from this purely potential character of the primitive ego :

a) The ego can not innately know itself in its primitive state, since it is still undetermined. The ego will know itself only by reflection on a becoming that has already been enriched through its acts.⁸⁷

b) The ego's acts must first be concerned with things other than itself. The Cartesian formula must be contradicted by reason of this, and we must say : "The soul is less easily known than the body."⁸⁸

c) Within the hierarchy of conscious beings which the philosopher can conceive, he must situate human consciousness at the lowest level. He finds it natural that superhuman intelligences could exist, who would know themselves directly, because they would always be in act, and above all a Divine Intelligence, in act in regard to the whole of being.

d) The human ego must be passive in a second sense, i.e., subject to influences outside itself, which are necessary for it to pass from potency to act (sec par. b.).

⁸⁷ See *Summa Theol.*, I^a pars, q. 87, a. 1.

⁸⁸ "This formula is capable of a true sense : the nature of the soul is more intelligible than that of the body. Its lack of precision is apparent if we give it this meaning : the existence of the soul is known before that of the body.

b. The ego is *passive* even in the production of its own acts. In order to produce them, its activity needs to be completed by determinations coming from outside itself, since it is impossible that it should be the sufficient cause of its own enrichment. To be precise :

It is impossible that a being in potency should be actuated by itself alone, since the act, which explains what it is now, could not intelligibly explain what it can become. This is the sense of the Aristotelian principle : *Omne quod movetur ab alio movetur*. This principle does not exclude the collaboration of the mobile in its movement. It merely rejects the position that the mobile is a sufficient cause for its own movement.

Now the ego is in potency in regard to all the acts it produces (see a.).

Therefore, in order to produce them, the ego must receive a complement, a determination, which places it in a position to produce them.

This necessity of undergoing an influence in order to act explains why physiological conditions are linked to all the activities of the ego. This conditioning would be incomprehensible if the ego were completel}' active.

We must, however, distinguish two aspects in the activity of the ego, since they can demand different explanations. Thus, I see this tree. Such an activity can be explained : (1) in its existence as an act, as a particular form of becoming : to see is not to hear, nor to deliberate; there is an explanation why sight *goes into operation* rather than hearing, or rather than reflection which is a prelude to decision. But (2) the reason why I see *this tree rather than* the table in my room must also be explained. In general, then, a movement is to be explained under two aspects : (1) as a movement or passage from potency to act; (2) as a very precise orientation to a particular terminus. In the first case, we invoke an *efficient cause*, and in the second, a *final cause*.

Thus the ego is passive in its operation for two reasons. First, by reason of *the exercise of its act*, it requires a *cause which*

places its potentiality in operation. Secondly, by reason of *the specification of its act*, it requires a *reason which directs* its act towards its object of the moment, which is only one of the objects which are possible for it. Now (at least if pantheism is not evident), the ego clearly possesses neither that cause nor that reason in a determined and autonomous way. Otherwise, as regards the exercise of its act, the ego would always be in act and never in movement. As regards the specification of its act of the moment, it could never stop joining itself to all the objects capable of interesting it, and could not pass from one to the other in an unceasing discourse. A psychology of the immutable is possible, but it is that of God, not of man.

We must, therefore, recognize the passivity of the ego even in its activity.

Its activity is thus an active *potency or power*. To indicate that actions are *immanent*, we will use the word *operations*, in order not to confuse them with transitive actions, whether of a physical or chemical nature.

The activity of the ego is capable of diverse orientations, and blossoms out in distinct kinds of operations. •• It has as many kinds of operative powers as it has kinds of acts.

We must now take up our problem again.⁰ How is psychological movement possible? Its possibility requires an active ego. For the moment, the nature of this ego is taken for granted as a starting point. It would not become if it were not, if it were not a certain kind of being.

But what we know about the psychological nature of the ego's activity is not enough, because it is passive as well as active. Whence come the influences which permit it *to modify itself* and take a definite *direction*?

We must now examine knowing and loving separately in relation to the above question, because what we have to say about loving depends on what we have to say about knowing.

•» See above. Second Thesis, C, D, E and F.

* See above. Third Thesis, A.

C. Actuation in knowledge. Once a subject has succeeded in attaining the knowledge *of* something, it seems natural that he preserve it and be able to use it as a definite acquisition, whether for the purpose of action, or as a stepping stone to further knowledge. We ought to limit our question to the *basic kinds of knowledge*. What is it that puts them into operation and directs them to definite objects?

1. An "impressed species" is required in every kind of knowledge.

By this technical name, "species impressa," we mean a *determination received by the ego from the object, which makes the ego like the object in some way* (species-resemblance).

This species is not an experimental datum. It would be useless to search for an image or an example. It would even be dangerous to propose symbols for it, drawn from physical, chemical or physiological actions. This is a question of knowledge which is an order apart.

The best thing to suggest the possibility of a "species impressa" is to consider the adage; "Quidquid recipitur ad modum recipientis recipitur." Take for instance a colored surface. Let its influence be exercised in a *physical* environment, e.g., the air; then in a *chemical* substance, e.g., H and Cl; then in a green *plant*; then on a *visual cell* having a cone. The one and same action of the color will be received in very different ways by these "patients"; the air will vibrate, H and Cl will combine violently, chlorophyll will create starch, and the nerve matter will be impressed in an altogether original way. Thus the same object produces different modifications according to the nature of the subjects which undergo its action. If a *completely qualitative ego*, a being with the power of knowing, is subjected to the influence of this object, is it any wonder, then, that the object produces in it a completely qualitative state? Should it come as a shock that this qualitative state, which comes from the object and carries its mark, should be a resemblance of the object in the subject? It is even natural that this resemblance should be oriented precisely in the direction of knowledge, since the subject is supposed to be apt for knowing. Thus the

“impressed species” is to be understood through an analogy with the general laws of action.

For him who understands what is strictly original in knowing, it is clear that neither a photographic image, nor a retinal image is comparable to this completely immaterial resemblance. This “species” is closely related to the truth of judgment, and it approaches that “adéquatio” between subject and object. However, it is inferior to this “adequatio,” since it does not attain the threshold of consciousness. It is not knowledge, it is only a condition thereof.

However, experience will show us what is revealed in the existence of a “species impressa.”

AN IMPRESSED SPECIES IS REQUIRED. In fact :

a. In order to know, the ego must be in some way like the object. To become a knower supposes a *becoming like* the object. However, this *similarity is never material*. The qualities of an extended thing are not present in the subject in the same manner in which they exist in the thing, i.e., according to the exteriority of parts in an extension. The question is how this similarity with the object comes to the subject.

b. It can not come from the subject, because he has to acquire it. The cause of this “impression” can be only *the object* itself.

1) Only the object itself *is exactly proportionate to such an effect*. Therefore, it alone can be the sufficient explanation.

Malebranche and Leibniz, each in his own way, have appealed to God’s influence to explain the competency of the subject for knowing this or that object. God, however, as He is in Himself, has no determined relation to this thing rather than to another. God intervenes as an explanation of my knowledge of an individual object, only if He Himself is in a precise relation to it, i.e., insofar as He has a completely determined idea of it. Here we find Augustinian exemplarism, a Christian transposition of the ideas of Plato. However, whether we will or not, we must recognize *the causal role of the object* in relation to the knowledge which I acquire of it. Malebranche gives the

object the role of an *occasion*, of which God takes advantage to make me see this object in His own ideas. As for Leibniz, he invokes God as the author of a *reestablished harmony*, which is set up, once and for all, between the states of the universe (objects) and the states of each monad (knowing subjects).

Consequently, the object has a causal role in relation to the knowledge I acquire of it, at least through the intervention of a God who knows it and makes me know it.⁹¹

2) Moreover, experience can be understood only on the supposition that there must be present an influence coming from the object before there is any knowledge of it.

Sensation, certainly, demands a *specific excitant*. Each kind of *image* presupposes a *sensation of the same kind*. Thus, the image via sensations also demands a corresponding specific excitant. Therefore, all sensible knowledge depends on objective data. In order to sense, the ego needs to undergo the influence of objects.

As to *thought*, it finds its original object only in the sensible. Consequently, it also demands, as imperiously as the senses, that the ego receive certain determinations from the object. The need which thought has for sensation condemns all idealism and innatism. However, we must recognize that this necessity poses a problem.

the intelligible species ought to make the mind *similar to the universal*, which is the proper object of thought. It, therefore, ought to be produced by a universal object, and because of that, it ought to be necessary (indifferent to becoming), eternal (indifferent to time), immaterial (indifferent to space), and infinite (indifferent to number). But such an object is a world apart from the objects of experience, whose influence alone

M The Kantian hypothesis admits, on the contrary, that the object has such characteristics, because the activity of the subject is directed by its *a priori* forms. We can not evaluate this supposition here, but will leave it to epistemology. The supposition does not correspond to the idea of human knowledge, as it is subject to an object and ruled by it. The hypothesis is contrary to our experience of knowledge.

w See E. Baudin, *Psychologic*, pp. 353, 363-368 and 416-420.

we undergo. All these objects are singular, contingent, temporal, spatially localized, and finite.

Every philosophy has been aware of this problem, and each has answered it according to its own metaphysical tendency.

a) empiricism tends to materialism, since, according to its teaching, there is no universal idea which is distinct from image, and therefore needs no universal object to produce it. Singular objects are sufficient. They impress the nervous organs, and that is sensation. They leave their traces in the brain, and that is the image. Certain impressions are reinforced, others are effaced in the course of successive experiences, and this is the abstract image. The associationism of Hume and of John Stuart Mill, the nominalism of Taine, the evolutionism of Spencer only play variations on this theme. •• It is true that Spencer recognizes in original ideas a kind of instinct, and thus a type of innate activity from which flow later acquisitions of knowledge. However, he remains faithful to empiricism by making of these instincts habits, which have been acquired by the species, and which are ultimately explained by the action of the environment on the subject. *There is no universal idea, because there is no universal object.* Thus, can we sum up the doctrine of empiricism.

We can easily see that knowledge depends on its object, and we can also clearly see that thought finds its origin in the sensible. •' But empiricism ignores the distinction between the intelligence and the senses. It forgets that the proper object of the idea is the universal. It passes by the problem.

b) RATIONALISM, in all its forms, takes the problem into consideration, and sees the idea as a result of spiritual activity.

** Actually, this is a kind of explanation and half-excuse for empiricism which frequently identifies *that which* is sensed with *that which* is thought. Empiricism mixes up sensation and thought, because it gives its attention only to the *that which*, in the "material" object, and is very often forgetful of the varied psychological attitudes characteristic of the ego's activity face to face with this object.

(1) In its historical beginnings, *Platonism* is the formal antithesis of empiricism. *I know the universal, therefore universal things exist*, subsistent ideas, whose influence on the soul produces science, and whose participation in sensible things produces order and beauty.

The spirituality of knowledge is safeguarded, but at what cost? (a) How can an existent reality be itself without being individual? (b) The link between thought and the sensible is very much diminished. Sensation is, for the soul, only the occasion for the soul's recalling the ideas which it had contemplated before its union with the body. Far from furnishing the materials of science, sensation is an obstacle to it. (c) The body is, therefore, not destined for the good of the soul, and forms with it only an accidental union, which union can be explained only by the soul's fall from a former higher state. Thus the unity of the human person disappears.⁹¹

(2) *Augustinianism* eliminates the first difficulty in Platonism. According to St. Augustine, the spiritual activity which results in human thought is not that of subsistent ideas, but that of God, the First Truth, whose Infinite Intelligence forms the exemplary ideas of all beings. This activity of God is creative in relation to things and illuminative in regard to intellects.

St. Augustine, however, being more concerned with metaphysics than with psychology, does not wholly accept the theory which concerns the relation of the sensible with the intelligible, and that of the body with the soul. Sensation is useful in those sciences which concern human things, but it cannot give wisdom, which has as its object "the eternal truths." This can be given only by a divine illumination. In what way is sensation necessary to thought, and the body to the soul? The problem, in Augustine, is unsolved. ••

M Summa Theol., I pars., q. 84, a. 4.

F. J. Thonnakd, A. A., *A Short History of Philosophy*, Eng. trans. E. Marian, C.P.P.S. (New York: Dcsclce, 1955), pp. 240-249.

The Cartesians, faithful to the same tendency, are forced to give an answer to this problem, but it is to the detriment of sensation, and in such a way that the equilibrium, protected by St. Augustine at the price of being inexact, is now definitely upset.

With Descartes, thought is the fruit of first ideas, an innate gift of God to the soul. With Malebranche it is a vision of the very ideas of God Himself. The mind receives from them its content and not only its form of necessity. St. Thomas was able to find a second way of interpreting St. Augustine: instead of being the object known by the soul, the divine ideas could be the cause of the knowledge of this object. For St. Thomas, only the elect know all things "in rationibus aeternis." In the present state, the intelligence draws from God, the Uncreated Light, only its visual power, and it is from things that it receives its determination of knowing.^{••} Thus does St. Thomas give a precision to St. Augustine's doctrine by correcting his Platonism through Aristotle.

The ontologism of Gioberti (19th century) was scarcely more than a revival of that of Malebranche, an admission that a certain immediate vision of God was natural to man. Rosmini (19th century'), on the other hand, had some originality. According to him, the soul, in an innate state, receives the intuition of the idea of being from God. This notion contains no individual determinations, and it is used, by reason of sensation which opposes it, to form universal ideas.

The same tendency to link all spiritual knowledge immediately to God is found in all these disciples of St. Augustine. Thus it is God who appears as the author of our thought. The person, at first disfigured by sensation which depends on the body, finishes by being completely absorbed in God who alone effects the knowledge of truth in the soul. Spinoza, in his pantheism, which took its inspiration from Cartesianism, shows one of the terms of this tendency, while Leibniz, in his idealism, shows us another.^{••}

^{••} *Summa Theol.*, I* pars., q. 85, a. 5.

What is lacking in these positions is the recognition of the fundamental role of sensation in the acquisition of our most spiritual ideas, and the failure to give man a *spiritual activity* proper to himself, instead of one which is completely derived from Divine Thought.

(3) *Averroism*, which introduced Aristotle into the West in the 12th century, filled the "separated" agent intellect as it was with Neo-Platonic interpretations, satisfied the first of these exigencies (it recognizes the fundamental role of the senses). Human thought comes about through abstraction made from images. But, far from satisfying the second (a proper spiritual activity for man), it destroys all personal spirituality. According to its teaching, the agent intellect, which produces the intelligible species in the passive intellect, can not be the "form" of a body, because it is purely spiritual. Consequently, being separated from all matter, it can not be multiplied.⁸⁷ Therefore, there is only one agent intellect for all men, and, because of it, human nature is eternal.⁸⁸

St. Thomas, in his controversy with the Latin Averroists of the 13th century, invokes experience as giving the lie to their theorizing : • (a) My thought is *subject to my will*, and therefore I am the author of it. — (b) Men are *not equal in knowledge*, even " if they possess the same images, which argues to the fact that their knowledge depends on a cause which is proper to each of them. — (c) Thought is a *specific characteristic* of man, and therefore it should be achieved in him and by him in his total reality, which is both active and passive. — (d) We experience within ourselves not only the appearance of ideas, but we also experience *ourselves as producing them*. — (e) To conclude : I am *master of my actions*. Moreover, my liberty is based on my thought. By this it is clear that my thought is my own work. If my thought

* Because prime matter is a principle of individuation.

♣ We can imagine it as a kind of Guardian Angel for all of humanity, an angel with the charge of making each individual know the universal which is potentially present in the images acquired by him.

" S.C.G., I. II, ch. 76.

is produced in me without me, my liberty vanishes, for that which supports it is not mine.

(4) *Kant* also believed it impossible to base the necessity of concepts and judgments on the pure contingency of sensation. For him, history had showed that the way, used to justify science up until his time, was at an impasse. His revolution consists in making objects depend on the mind in everything which is "formal," i.e., knowable. There is a datum (something given), but it is inactive, it does not really produce. It is the mind or spirit which makes a sensible object of the datum, and then fabricates a concept by an autonomous activity, which is constrained to operate according to "a priori forms." Intellectual activity is a constructor of all the necessary relations which constitute objects.

His followers saw clearly that *Kant's* doctrine had made the datum completely useless. Actually it had no role in knowledge. It neither caused knowledge nor was it known in itself. Logically, then, they suppressed the datum. They recognized only one reality, the mind, which thinks and fashions its own objects. Both mind and objects known are spirit. In post-Kantian idealism (*Fichte*, *Schelling*, *Hegel*) the human mind is a God who creates the world.

Experience will always protest that man, in thinking, depends on things, on their similarities, and on their differences. The very nature of truth demands that objects be radically other than the mind which judges them. We must search for the cause of intelligible species as being something other than an intellectual activity which is *independent* of sensible things.

(5) *St. Thomas* and the Scholastics in general have situated it in an agent intellect, which is proper to every human being.

ABSTRACTION :
 ■ *personal agent intellect.*

(a) **EXISTENCE.** This solution is found by the elimination of the others. In order to conceive a universal, the intellect

needs to receive a universal intelligible species. The cause of this species is not sensation or image only (thus empiricism is false), but an activity which is properly spiritual.

This latter is not *a universal thing*, as Plato believed; it can be only an active intelligence. But what kind of intelligence is it, human or divine?

a. *God* cannot be the *only* author of these ideas. Thus Cartesian innatism, the ontologism of Malebranche and its derivatives, the pantheism of Spinoza, and Leibnizian idealism, are eliminated.

b. A "*separated*" *agent intellect* would destroy the personal character of thought and will : therefore Averroes is mistaken. The same is true of traditionalism (De Bonald, La Mennais, 19th century) for which the origin of higher thought is language, which is the social transmitter of a primitive truth revealed by God to the human race. This criticism is again true of sociologism (Durkheim, Lévy-Brühl) which makes society the inspirer of thoughts and the generator of mental functions in the individual.

c. *An individual agent intellect*, which is, therefore, non-collective, is required as cause of an intelligible species. However, it cannot produce it without some dependence on the image. Kant 100 and the idealists whom he inspired forget that the universal is originally grasped in the sensible.

We must, therefore, recognize that human thought has its source in a spiritual activity, which is innate to the mind of each human being, and which uses images with a view to producing an idea.

100 Kant himself asserts the concept is formed beginning with sensible phenomena, through the medium of images or schemata (see Thonnard, *Short History of Philosophy*, Nr. 401, 2 and Nr. 403), but he denies that the content of the concept (its comprehension) is drawn from the datum which is first sensed and then imagined. According to him, the sensible phenomenon is already actually a "construction," whose "form" comes from the mind, and whose datum, the real, is not present in any determined way. For Aristotle and the Scholastics, however, the sensible is, above all, the real thing, acting in a determined way on the mind, through the intermediary of "phantasms," "images" or "schemata."

(b) the role of the agent intellect is essentially that of producing an intelligible species in the mind (more specifically here, in the passive or possible intellect), by reason of which the latter becomes similar to a determined universal object (e.g., the "sonorous," the "white") through forming a concept and knowing it.¹⁰¹

This production of the species is not a creation; it is *an abstraction*. The agent intellect draws it from sensible objects, i.e., from images which are unceasingly present (the sound of a bell or an automobile...). These objects do not contain a ready-made universal "in act," but they contain, in an individual and concrete way, all the notes which the universal signifies. The agent intellect, which is an innate tendency to the universal, is interested only in those notes in the image which are capable of universalization. In using these to the exclusion of others, it produces their resemblance in the passive intellect — thus the intelligible species.

The agent intellect has sometimes been compared to X-rays which reveal internal and hidden organs to the sight. The comparison can illustrate the idea that the intelligible species is produced by the real, even if under a higher light which shows only a part of this real. However, this example is dangerous in that it suggests a segmenting of the real. Remember that a universal characteristic is not a piece or a part of a thing, but an aspect of this *whole* thing. The abstraction which makes us see the universal is, therefore, *neither an extraction nor a segment*. The universal species is not completely in the image, as would be one of its parts. There is not in a clock, a car or a watch... a part which is a sound and nothing but a sound. Abstraction is a "*de-individualizing*" of concrete characteristics which are extended and individual in the image, whereas

The agent intellect and the possible intellect (potential) are at least two distinct functions of human intelligence. According to St. Thomas, they are two really different qualities of the soul, two operative powers. Their actual roles in respect to the intelligible species are opposed but complementary (the agent intellect is the cause of it, whereas the possible intellect receives it). In relation to the species, the first is in act, whereas the second is in potency. Therefore, we cannot identify them.

extracting, cutting out would leave the cut-out part with all its previous determinations and only make them more explicit.

That which best exemplifies the role of the agent intellect in experience is the fact of *attention*, which can be defined as a determined orientation of knowledge towards a particular aspect of objects and the ignoring of the other aspects. Thus the agent intellect can be described as an innate attention, which the human intelligence brings to bear on that which is capable of universalization in the sensible, an attention which has the necessary consequence of abstraction from the concretely spatio-temporal aspect, *the hic et nunc* of the same sensible. The effect of such attention is the passage from the individual known to the universal conceived, and, therefore, to the necessary, the immutable, the eternal.

By de-individualizing, the agent intellect does not construct a new object with the aid of completely new materials. If this were so, no intellectual knowledge of sensible things would be possible to us, because intelligence would be, in such an hypothesis, completely different from the sensible. The agent intellect is then limited to *illuminating* and making the non-individual traits within the image capable of impressing the passive intellect, which process implies an exclusion of strictly individual characteristics. Thus the *image* truly *collaborates* ¹⁰¹ in the production of an intelligible species and it is capable of furnishing thought with its first content. The image *reflects* in some way the light which the agent intellect shines on it. However, this light is different from material lights, because it does not bring along with it any new element, which

1w St. Thomas sees the agent intellect as the *principal cause* of the intelligible species, and the image as the *instrumental cause* of it. "In receptione qua intellectus possibilis species rerum accipit a phantasmatibus, sc habent phantasmata ut agens instrumentale et secundarium, intellectus vero agens ut agens principale et primum" (*De Veritate*, X, 6, ad 7). Only that which the phantasm brings is capable of universalization. It is the agent intellect which makes it universal. By reason of the intelligible light which directs it, the spontaneous analysis of images facilitates the separation of the universal from the phantasm.

See Maquart, *Elementa Philosophiae*, II, pp. 370-375.

could alter the "color" belonging to the illuminated object. This light simply makes knowable what was not, but could become knowable. This light of the agent intellect makes possible the impressing on the mind of a universal resemblance of that which, in itself, is singular, but which, nevertheless, conceals an aptitude for universality {sound, which is realized equally in a clock, a car, or a watch...).

(c) *conclusions*. We can see the abyss which separates the thought of St. Thomas from that of Kant. Undoubtedly, for both, the universality and consequently the necessity of concepts comes formally from the human mind. The necessity of concepts is also the indispensable condition of science and thought. However, for Kant, this *universality* has no guaranteed foundation in things; it is *created a priori*. For St. Thomas, it is " *in potency* " in things; it is only actualized by the agent intellect. For Kant, the entire *content* of knowledge is a *production of reason*; for St. Thomas, it is, above all, *the things themselves*.

St. Thomas, nevertheless, *welds together the partial truths* contained in the other solutions. He recognizes, with empiricism, the role of sensation in thought. With Plato and St. Augustine, he recognizes the immediate dependence of the mind on truth, and the mind's participation in the ideas which God has of things. With idealism, he recognizes a spiritual activity in the mind, by which it thinks *its* ideas and freely directs *its* life. However, he does not merely juxtapose these truths; he binds them together. Two metaphysical links are here subordinated one to the other. God, the *supreme link*, communicates His thought to things and minds simultaneously. There is nothing astonishing about the human intellect finding the intelligible in things, since they are constructed on the plan of the Divine Ideas. The soul, *the link of the human being*, and the form, *the link of corporeal beings*, are bound together by knowledge in the measure that they exclude matter which limits and opposes them. Intelligence, which, of all knowledge, is that most intimate to us, demands a " dematerialized " and universalized object, and, consequently, an agent intellect whose function will be to make

a purely intelligible form emerge from the image in which it is "incarnated."

Thus is the problem, as we have posed it, resolved. The agent intellect and the image are the sufficient causes for the orientation of intelligence towards the universal, which has its beginning in sensation. The agent intellect is always in act, tending towards the intelligible in general. It lacks a determined content. The image furnishes it.

Here, then, is the subject at that stage of knowing, which may be called primordial, since it involves an intuitive grasp of reality. Here, knowledge is dominated and directed by objects, since liberty can choose them only by reason of a thought which is already formed. It is the impressed species, produced by them in the ego, which turns psychological attention towards them by a kind of mental "ontotropism." 103

However, we now find ourselves confronted with a new problem, if we take notice of the fact that the same object can evoke differing directions in us. For example, I have *heard* a melody; but *I remember* only a certain rhythm, and I *think* only of the general meaning of melody. The single actual melody is grasped in three different ways. Whence comes this diversity? It comes from an activity of the ego, which creates the object.

2. An "expressed species" is used by me as a means, as an instrument, to grasp an object, whenever I use my imagination or think, when sensation does not demand this intermediary which has an internal origin.

a. This term *designates* a "resemblance of the object (species) which the ego, determined by an impressed species, produces from its innermost activity (*expressa*) and within

"» The biological fact of tropism (the geotropism of roots and branches, the chimiotropism of male gametes, etc.) implies that living things receive an influence from their environment, and their reaction directs their growth and their displacement in a direction which is generally useful to them. In a similar way, being, in the midst of which the subject lives, influences it and creates an orientation which makes it able to know it.

which it grasps the object. " The object known can infinitely surpass this resemblance, but nevertheless, the object can be known only by reason of this resemblance, and according to its measure. This measure is first of all that of the impressed species, then that of the ego's activity as it is enriched by the determinations received from the species. Thus the individual man, of whom I am thinking, is known to me only according to the measure of the images and ideas which I have formed of him, and this measure depends on the "impressions" furnished by sensation, and on their spiritualization by the agent intellect.

b. *The existence of an expressed species is attested to by experience.* Everyone is conscious of his images and his ideas. He also knows that he is the source of them, and, at times, the free author of them. Nevertheless, despite the contention of Descartes, this experience is not a direct one, but a reflex one. First, I know *the object* pictured or thought, then only the image or the idea by which I know it. The opinion of subjectivism does not conform with the facts. I do not have to conclude to the existence of objects from the starting point of my ideas and images, as the first things known. Moreover, what would an image or an idea be, devoid of all objective content? What is true is that the represented content is not purely identical with real objects, it is that which I picture or think of real objects, that which I know about them. This actually explains why such tremendous efforts must be made by the mind to arrive at a thorough knowledge of things.^{1M}

*♦ In scholastic terminology, the expressed species, the image (phantasm), or the concept (mental word), is not the "id quod" which is primarily known or the "ex quo" through whose medium a thing is known. It is the formal sign of the thing, a sign in which the thing itself is known immediately.

It is an intermediary¹ only in the ontological order, but not in the order of knowledge. It has no other value nor reality than that of a pure sign. By it, I know only the thing represented, and the sign itself as representing the thing.

See Maquart, *Elementa Philosophiae*, II, p. 382 sq.; Parker and Veatch, *Logic as a Human Instrument* (New York: Harper, 1959), pp. 16-23.

c. *The necessity* of the expressed species flows from the relation of the knowing ego to its objects. This relation is a "truth," an "identity," a unity between the essence and existence of the ego and that of the object.

Now there is a type of knowledge wherein the object is necessarily present to the ego in its essence and existence, and that is *sensation*. Sensation supposes the present activity of an object (an "excitant")• This sensation gives precise knowledge about certain determinations of this excitant, namely, the sensible qualities it produces when the subject and the object are joined (particularly is this the case in sensed extension which is common to both). In this kind of knowledge, there is no necessity for an expressed species, for the object sensed is immediately present to the subject.

However, in all knowledge whose object is not necessarily united to the ego through its existence, or can not be united to the ego, even according to its essence, it is necessary for the ego, if it wishes to know, to produce a duplicate of the object, of the essence and existence to which it will unite itself. The ego will be united to its existence, since this duplicate will exist by the activity of the ego; the ego will be united to its essence, since this duplicate is constructed according to the very same determinations which have already been acquired from the object by the ego (*species impressa*). The first hypothesis is realized in *the imagination* which knows the objects of sense, even when they are not presently acting on the organs. The two united are realized in *thought*, which not only attains absent objects, but also grasps them in their universal characteristics when these traits have real existence only in an individual way.

To conclude : The image, the idea, are expressed species — they are *representations*, which are distinct from sensation. Thus we must recognize that the notion of representation is narrower than that of knowledge, and that representation is not the essence of knowledge, but only a condition of it.

3. We can sum up the formation of a simple idea schematically.

Let us take a colored object as our example. This rose-colored carnation (No.1) which acts on the retina of my eye produces in my visual power an impressed species (2), by reason of which I see (3) its form, its movement, its proper shade of rose. This visual experience involves another of the powers of the ego, that of imagination, and a determination is produced there by virtue of the same impressed species (4) by which I can

see again (5), even though it be absent, the rose color of the carnation which I contemplate as an image, which I have produced as an expressed species (6). However, the agent intellect (7), an innate light, has already lighted up this image in its "colored" aspect, leaving in the dark all that is individual in the rose color, and by this action it produces a definite orientation in the passive intellect, an impressed species (8); then I understand (9) the notion "colored" by expressing its content in an idea, expressed species (10), and through it I think or can think of every colored object, as well as of the image (G), or the carnation (1).¹W



Obviously, the real movement of knowledge is infinitely more complex than this schema. This movement depends in part on the subjective association of images which results from the influence of interests. It also depends on objective associ-

* Our intention with this diagram is neither to suggest a snail, nor to illustrate a new form of abstract art. It is only a diagram, which recapitulates the causal links (in the form of arrows) and intentional links or those of knowledge (under the form of lines without arrows, whether broken or unbroken). We hope to show by it the fundamental organization of these links. It will be of help only to the mind which is still a little bit lost in the morning fog. From the others it can only hope for the indulgence of a smile!

ations, which result from experiences which are fortuitously contiguous, and especially those which are bound up with the necessary relations of resemblance, contrariety and causality. Knowledge also depends in part on the direction which free will impresses on the entire psychological life. It will be sufficient to indicate here what fundamental condition ought to be satisfied in the ego, that will guarantee its passage from the capability of knowing to actual knowledge. The ego must be determined and directed to such knowledge by an influence which is always objective, and which is, originally, in sensible things. In respect to thought and imagination, it must produce in itself a duplicate of the object which it understands and with which it is united. Finally, the ego must have an intellectual activity in it which permits it to abstract the intelligible from the sensible.

We must now turn our attention to see how activity and affectivity are, in their turn, determined, but we shall concern ourselves with them only as they play a role in the direction of knowledge.

D. Actuation in desire. Tendencies do not pass to act under the form of desire, pleasure or sorrow, except under the impulses given by the "movers" which are suited to them. These "movers" are by nature *acts of knowledge*. They introduce into a tendency an *orientation towards* an OBJECT known, which then fulfills the function of *end*, and takes on the color of a *good*. The end is nothing other than the terminus to which a movement tends.¹⁰⁶ The good is anything which is capable of satisfying a tendency, anything which can be desired, anything which can be a factor of interest. Different ways of knowing involve different ways of desiring. These differing ways of desiring are called "appetites." ¹⁰⁷

* *Summa Theol.*, I^a pars. q. 5, a. 1 "Ratio boni in hoc consistit quod aliquid sit appetibile."

MT Appetitus — a power directed towards action.

Appetitus naturalis = the appetite which passes from potency to act *without* a previous knowledge of the end.

Appetitus sensitivus -> that which passes to action by reason of the determination (or "form") acquired through sensible knowledge.

Appetitus intellectivus = ...acquired through intellectual knowledge.

The "rational appetite," which is directed towards the intelligible, cannot pass to act in the same way that the "sensible appetite" does, since the latter is directed towards the sensible. Just as common sense does, psychology recognizes the "rational appetite" as having a certain free play, a certain independence in relation to its objects. How is this liberty *-possible?*

It is the job of metaphysics to base this liberty on rational knowledge, and by this, fully guarantee human liberty and make it intelligible. Free will exists, and its conditions have been studied in descriptive psychology, wherein determinist objections have been resolved; but then the question still remains: How is free choice possible? If it is a determination which the ego gives itself, must we not say that liberty is the power of *determining self without sufficient reason?* Actually, it seems that if a sufficient reason exists, it will involve the will necessarily, and leave no place for the function of freedom.

1. the sensible appetite is a less mysterious affair. It is understood through analogies with natural finality. It is actually only natural spontaneity as *modified* by sensory knowledge. This latter furnishes the sensible appetite with special excitants, which are *known* objects, whose action, for that reason, is not merely mechanical, but psychological. The mover of the sensible appetite, of impulses and aversions, of physical pleasures and pains, like that of a falling stone, is a corporeal reality. But here it is that reality insofar as it is a sensible object, i.e., an object, and not a thing.

Because of this, there exists in the appetite a complexity which is very much greater than that involved in the spontaneity of nature (*natural appetite*). The reason lies in this, that within the same physical environment, a great number of different objects can be present, or can be represented by sensible knowledge, e.g., to the cat the kitchen may represent the milk, the roast, a corner by the fire,... or the broom of the cook. Each of these objects awakens desires, which sometimes are so contrary that they come to the point of suspending action momentarily, and give the animal the appearance of deliberation. ^{10g}

¹⁰¹ Fontaine writes: "Miraut, having philosophized on this odor, concluded that this was his hare...."

We can never state, however, that this "deliberation" results in the invention of new objects, nor in original actions, which, by their originality, would show desires to be independent of the objects known. The sensible appetite is, therefore, completely subservient to the objects which are presented to it. Its determination, its direction of the moment, is derived from them.

It is, undoubtedly, not the objects which create the desire, but they cause such a desire to be produced by an innate or pre-acquired tendency. They confine the natural impetus of desire by their concrete, spatial and temporal limits. Furthermore, in order that a corporeal reality be a mover of sensible desire, it has to be known under one of the aspects which correspond to this natural tendency. It is not every sensible object which causes desire, but that object which is grasped as being in harmony with a spontaneous tendency. This is the "good" in the object, i.e., its capability of satisfying a need, of terminating a tendency, of completing a being.

How does it happen that this appetite breaks out in desires of every kind, impulses, revulsions and various emotions? Because sensible knowledge places the appetite under the influence of an individual and material object, by grasping in this object a particular concrete good. This objectively and subjectively individual good^{10*} is the proper mover of the appetite. It places the appetite in act and finalizes it, in a determined way.

In man the manifestation of sensible desire is realized in a more complicated fashion than in animals. Over and above the forms which are proper to it, it can be dominated by intellectual functions and acquire a kind of liberty; but this liberty belongs truly only to the will which then commands it. This liberty never affects the necessity which links a sensible object to its proper tendency.

a. As an example, take a *perception of* cherries, which automatically involves the gesture of carrying them to the mouth. This gesture is simply the full realization of a sensible desire.

IM Hoc mihi bonum.

b. A *simple image*, evoked through association, excites the desire to possess or to construct the object imagined. It seems that this is the specific mechanism of instinct. The impulses or drives which are fundamental to instinct are not blind mechanical forces, but are the fruit of a sense appreciation of the objects of imagination, perceived as in agreement with tendencies. This is certainly the law of psychological automatism in man :¹¹⁰ the sight of a movement provokes the beginnings of a movement of the same kind in us. The image prepares the realization of the represented gesture. The ideo-motor action is explained by an association of images involving the desire and its accomplishment.

c. *Thought* is neither the necessary nor the sufficient cause of sensible appetite : " *Universalia non movent.* " But it is not exercised without images, and it is often concretized in individual objects. It is also natural for thinking man to experience corporeal desires and emotions which are intimately mixed with the spiritual. Thought, therefore, moves the appetite through the medium of images, but by the domination which thought can exercise over appetite,

d. *Liberty* becomes capable of governing sensible desire and consequently able to command a physical action. A free decision establishes concrete judgment within the very heart of the subject, which is completely determined and concerned with an individual object. How could this happen without the collaboration of an image, since the image is the normal way of individualizing an idea, which, taken in itself, is universal? Here then, we have the image placed freely in the subject, and, as a natural consequence, the acts of sensible appetition referring to their object. These acts of appetition can be called free, not because they need not follow an image, but because the image with which they are necessarily involved, has, through the operation of free will, received the rights of a citizen in the kingdom of personality. Epiphenomenalism, then, makes a

¹¹⁰ Both Baudin in his *Psychologie*, pp. 559-566 and Eymjeu in his *Le gouvernement de soi-même* (Paris : Perrin, 1935). PP- 25-181 give facts and excellent interpretations.

serious mistake by denying the influence of the will on the body, under the pretext that such an influence is inconceivable. In order that liberty exist, it does not have to suppress psychophysiological determinism. It supposes it and directs it. The operation of the sensible appetite remains *necessary*,¹¹¹ but because of the possible subordination of its mover, image or sensation, to the influence of a free will, the acts of the appetite can be called free in their cause and, since this is so, they can be considered as objects of morality. Because of this, morality extends to external actions, even though their bonds with things are subject to natural determinism.

This elevation of sensible appetite to the level of moral liberty should not prevent us from recognizing the true nature of sensible appetite. Motivated essentially by sensible knowledge, it has as its proper object the corporeal individual grasped as being presently agreeable to the subject and, in this, appetite cannot fail to follow the direction which its tendency imposes on it.

2. the will or rational appetite is opposed to the above appetite both in its object and its operation.

a. In its object. The will, because it is motivated by thought, has necessarily for its object the good insofar as it is thought, the good in general. The notion of the good embraces that which is in accord with any particular tendency, as well as that which basically satisfies all tendencies, that which is good for anyone, and is good for me, that which is good at this moment, as well as that which is good beyond all temporal duration. Thus the will manifests a *capacity for objective indétermination*. Its object can be proposed to it under forms which are not equally determined.

In the case of the sensible appetite, the object, since it is an individual material reality, is always completely determined to the point demanded by concrete action. With the will, the object can, on the contrary, be presented under purely universal or incompletely individualized characteristics. As a result,

¹¹¹ Necessity demands that a thing be realized necessarily.

action on such an object becomes impossible, and the incomplete will seeks to perfect itself. Because of this we understand the diversity in successive acts of the will. They are striving for an object which is completely determined in the way that action demands,¹¹² but that object can be attained only through thought. Consequently, the movement of the will provokes a correlative movement in reason, which *little by little*¹¹³ determines the Universal Good, which was first grasped.

(1) The simplest and the most primitive of the acts of the will can thus only be the *desire* of a desirable known in a completely vague way. The mover of the will can be the most obscure consciousness of a need, the *seizure* of some fragile pleasure as well as the most penetrating judgment on the profound misery of man. "I do not know too much about that which I wish," but I know that I wish it, and I expect some happiness as a result of it. Yet, if I wish it, what course of action shall I pursue to find it? (2) My *intention* can search for it in an *idea which may be -precise*, but still remains universal, in an end, e.g., health, pleasure, virtue or science, which are still non-real objects, but within which are found the seeds of a thousand real actions. Thought, which at first was pushed at random by a vague appetite, is now directed. It *takes counsel*, proposes means, judges their appropriateness to the end; but those which it retains as possible, as more or less useful, are found to be such only by reason of *a will which is agreeable to them*. We now arrive at (3) "consensus." These means have no value for the intention, except in view of the end. Depending

»« See Baudin, *Psychologic*, pp. 571-575-

The will can be completely determined in an instant. This is most often the case with the decisions made in the little problems of daily life. It is even the case in unusual contingencies for those who are strong willed and resolute personalities, who are always masters of themselves. This can even be the case sometimes with pathological personalities, who are impulsive and precipitate. However, the will's internal functioning can be revealed to us like the stages of movement in a slow motion film. A methodical study cannot fail to reveal voluntary-decision forming itself little by little in union with the light of thought.

This study, moreover, is not pure artifice. How many wishes do not terminate in action, because they never ripen into determination, like seeds whose first sprouts are scorched by the sun?

then on the idea of an end, a system of objects for action is constituted, each of which is recognized as a means, and is desired as such. Nevertheless, the will can not find its fulfillment here, because it remains inefficacious, concerned simultaneously with several diverse actions. It becomes efficacious by reason of *choice* (4) “electio,” accepting one and rejecting the others. In this choice there is incorporated a *practically-practical judgment*: “Here is an action to be chosen by me right now.” The order thus infused by the intelligence and *maintained in force* (5) “usus activus,” by the will, commands the execution. A *conscious grasp* of the end, once it is achieved, will place the will in a state of *enjoyment* (6) and will transform active love into affective love. To sum up, the impetus has been given by a thought, which reveals a need and awakens in me the innate love of happiness. In the course of voluntary movement, thought progresses in the same direction as the will, in the direction of an increasing determination towards a decision. This decision involves a practical judgment, which is completely concrete.

This mixed movement will be understood provided we do not divide it, provided we consider it as being an indissoluble union of thinking and willing in the movement of the ego. Actually, the will is a source of action. It is a cause which puts deliberation into action. It utilizes all kinds of knowledge and places them at the disposition of judgment. The intelligence, on the other hand, is a source of determinations, by reason of the objects whose characteristics it has assimilated. From it comes the direction which the will acquires little by little. Thus we understand the becoming of the will (*its exercise*), and its direction (*its specification*), the will acting, the thought directing. The will is thus always in conformity with a judgment, but the judgment is subordinate to the will. This is true also of sensible desire which conforms to an image, and the image is evoked with a dependence on the desire which makes the object “interesting.” That which primarily differentiates one from the other lies in the fact that the pair, will-judgment, can exist in more or less *determined states*, because the proper object of the will is the good in general.

b. In its operation. There is a second aspect in which the rational appetite differs even more profoundly from the sensor]' appetite : the will is *free*. In this, the will is unique. In this its metaphysical possibility is more profoundly hidden. Where can the sufficient reason of a decision be found, which is not the necessary consequence of its conditions?

In the conditions themselves? The conditions which would explain this particular free decision must be the very same conditions which would explain the contrary decision which was not made. The conditions explain the equal possibility of alternatives, not the existence of one to the exclusion of the other.

In the decision itself? It must be; but is it not contradictory that a fact should be its own sufficient reason? Certainly, if it is taken in itself alone, but not if it is taken conjointly with its conditions. What then are the essential conditions of a free choice? How explain these conditions? What remains to be explained by the choice itself?

1) The essential conditions of free choice are summarily those which link the choice to its object which is a completely practical and determined thing. They are found in the *practicall/y-practical judgment* and in its *object*. What ought this object to be in order to be the object of free election?

a) This *cannot be the proper object of the will* taken in itself, because the link which binds a power to its proper object is strictly essential and can not be broken. Without it the power would be nothing. It is, therefore, impossible that a power function without being united to its proper object. There is no room for liberty here.

Now the proper object of the human will is the universal good as known by the intelligence.

Therefore there is no liberty to choose or reject an *object known purely as good*. Such an object is presented in several ways :

(1) *The universal good* can be thought of in its total extension. It is beatitude, happiness without restriction, embracing every point of view, and in no way identified with any determined object, as would be the case in God, riches or

pleasure. This good is desired in every act of the will, as the very reason of desiring whatever the object desired. It is the good pursued in every desire.

(2) A *particular object* has only a very limited goodness, but it now appears to me *under the single aspect of its goodness*. In this glass of water I see only the allaying of my thirst. This is a very frequent case, before any deliberation. The first movement of the will is not free.

(3) A *particular object* can furthermore be the *only way* of realizing an end about which I have already made up my mind. I wish to write and I have only one pencil at my disposal. In order to write, I am not free to choose a pencil.¹⁴

In this case, I could undoubtedly not wish the object (my will is contingent); but then I would wish nothing and that would necessitate that I do not think of the object. On the contrary, thinking of it in the afore-mentioned conditions, I can not stop myself from willing it, I can not be free in willing it (my will is necessary here with a natural, hypothetical necessity).

b) The *object* of a free choice must, however, be *contained within the extension of the proper object* of the will. Actually, it is impossible that a function attain an object in an}' other way than under the formality of its proper object, for it can attain through the latter only what is contained in its extension. To use an example : a flower is visible only because it is part of colored things. The object of a free choice, then, must be *known* as a good, being part of the notion of The Good, i.e., *as a particular good*. This hypothesis is realized in several ways :

(1) The definite good in which we situate the Sovereign Good is grasped as a particular good, by reason of our abstract manner of knowing, and also because of the multiplicity of our tendencies. Whatever be the object of our will, God, virtue,

¹⁴ Evidently I can remain free to write, but that is another problem. Faced with this hypothesis, I am free to write or not to write, according to the conditions I place in the hypothesis. See *Summa Theol.*, I^o pars, q. 82, a. i : "Necessitas finis non repugnat voluntati, quando ad finem non potest perveniri nisi uno modo; sicut ex voluntate transeundi mare fit necessitas in voluntate ut velit navem."

science, pleasure, racial interest, it does not contain for us all the kinds of possible goodness. It always appears to us as particular. God is not visible ; virtue and science demand painful effort ; pleasure often excludes virtue ; racial interest demands sacrifice from the individual. These are, for our intellect and consequently for our will, particular goods.

(2) An infinite *variety of objects and actions* can appear to us *as means* of realizing happiness, that end which we are ever seeking and never finding, even though no one of these seems capable of giving us complete happiness. Each gives us only a part and refuses the rest. The part that is given is given only for a time, and as it is given to me, deprives me of something else in which I have an interest.

In these two aspects of a limited good, I see, together with the good which attracts me, a limit, an absence of a good, which repels me. In these conditions, in this determined state of knowledge, the will also can only be determined in the same ambiguous manner, containing a yes and no simultaneously in relation to the same object. Following its own natural law, the will is attracted and repelled at the same time by each particular good. It desires and does not desire to pursue the particular good. There is no need of a plurality of objects : one single object is sufficient to pose, within the will, an alternative whose separation from that single object has a vital importance and exercises on the will the attraction of the good. This indecision would, indeed, put a stop to action, to progress. To live, we must go beyond it.

2) *What remains to be determined* by free choice in these conditions? Simply, the direction which the voluntary act will follow between two possible directions. How is it that the will can choose this part in preference to the other?

Psychological determinism 113 thinks that the reasons can be found only in motives.^{u*} It forgets that these are exactly what

James E. Royck, S. J., *Man and His Nature*, p. 192.

IM Sully Prud'homme describes this determinism as follows :

" Seul le plus fort motif peut enfin prévaloir ;
Fatalement conçu durant qu'on délibère.

puts desire in two different directions, where it can not remain without dying. The yes is desirable and so is the no. It further forgets that the motives for the yes are not opposed to those of the no, as in a subtraction. They are different, not homogeneous. UT Finally it forgets that the "better"¹¹⁸ can not infallibly determine the choice, for the better is always only a limited good, and because of that it implies simultaneous attraction and repulsion, a call to and a refusal of action.

It is not through being subjected to some *influence*, even if it is purely *intellectual*, that the will finds the power to make a choice. It is in itself, in its activity of the moment. This activity is primarily by nature a thrust towards action, a means to happiness. By its previous choices and by acquired habits, it can already be directed towards a concrete ideal, and be more desirous of choosing the direction already preferred. Finally, in any case, it is oriented, through deliberation, to a completely concrete act and simultaneously to its abstention as well. How, then, is the indétermination between the yes and the no to be done away with? It will be sufficient to observe here that in the will there is an innate thrust towards the good. To will the good demands choice, since without choice, the will is inefficacious. By its love of the end, the will abolishes the alternative between the yes and the no.

Can it not very well be said that there must be a reason for rejecting one and preferring the other, and that this reason is

Fatalement vainqueur, c'est lui seul qui opère
La fatale option qu'on appelle un vouloir. "
" Only the strongest motive can finally prevail:
Inevitably conceived while we are deliberating,
Inevitably the conqueror, it alone calls forth
The inevitable option which we call a will. "

Such is the case in the motives of duty and those which involve pleasure or pride; or, outside the domain of morals, motives which may draw me either to take a walk or to read this novel on this beautiful day of my vacation.

If there is a liberty even when faced with the best, it is not this choice of the best which constitutes liberty. Let us make a distinction between psychological liberty (choice) and moral liberty (the ability to place a morally good action). The sinner is free in the first case, but in the second case he is not free : he is a slave.

not in the end, which, in its extension, embraces precisely the yes and the no about a particular means? The objection seems to take the will for a thought which goes from the universal to the particular, or from genus to species. The will is not looking for a truth, it is looking for a good which is an object of action. Thus its activity which is turned towards the good, in whatever form it may be, is a *fortiori* active (desirous) in relation to the latter. That which it lacks by nature — a determined object — is furnished to it by deliberation. It cuts off deliberation by acting in one of the acquired directions. “• In order to choose, it does not have to give itself a new and more specific object (this enrichment would lack a sufficient reason). It has only to accept one of the contrary objects presented by the intelligence and thus refuse the other. Choice, being a restriction brought to the direction of the will, not an increase in direction, requires only a power of action capable of pursuing the good, even though it renounces some particular good.^{1W} Thus liberty is not unintelligible. It is simply a power of action, which is superior to the obstacle which a perceived contrariety of goods opposes to it.

Thus, *it is exercised essentially in the suppression of this contrariety* at exactly the point where it is *conscious*, i.e., *in the judgment*. It is that which is the cause of this practically-practical judgment. Here is the reason of my present conduct. Without it my thought accepts the two opposing counsels as true : this line of conduct is good for me, and it is not good for me. Drawn towards action by the will and with it, nevertheless reason remains fixed in its first attitude. The last judgment which closes the deliberation is thus simultaneously cause and effect of free choice. This judgment is the source of its direction (its specification), it is the final cause of willing, but it is articulated only under the active impetus of the will, it is

Deciding is not thinking in order to act, it is acting while thinking. The agent here is not the "will." It is the entire ego, the person, the existent being. "Actio est suppositi."

“• From this point of view, the problem of decision comes close to that of the individuation of a form. In both cases, there is a limitation of their virtualities, and even an indispensable limitation in order that they can exist.

the effect of its will. Here, then, is a reciprocal causality, wherein we can see the indissoluble union of thought and action, which alone makes liberty possible. Without thought, action is blind and fatal : without action, thought is only a reflection of the necessity of its objects. Through a judgment on the value of the good which solicits action, action becomes capable of dominating itself, of being master of itself, it is free to go or to hold itself back. It is thought which makes liberty possible, but from within, and that is why thought is moved by liberty.

c. conclusions : 1) *The supreme degree of independence, which the ego has* in relation to its objects, is called free will. *Nevertheless*, that will remains *dependent* on objects through the intermediary of thought. In its becoming, the direction of the will is partly derived from objects known. The forward push belongs to the very nature of the will. The actuation of desire is, therefore, not impossible, nor is its real relation to things. And man's domination of nature is possible in its turn, despite the claims of epiphenomenalism.

2) *The supreme degree of the unity of the ego*, which is the free will, also supposes a *real diversity* in it. Thinking and willing should not be taken for each other, unless we wish to destroy liberty. Likewise, we must remember that the oppositions and limits of particular goods, the only objects of free choice, suppose a real multiplicity of tendencies in man, which constitute among correlative objects as many particular goods as there are tendencies, e.g., light is a *good* only for a being who is capable of seeing.

E. The distinction between operative powers is therefore :

1. *real*. — potency and act are correlatives of the same kind; one is incomplete being, and the other is the same being, but complete, fulfilled potency is defined by the act of which it is the capacity.

— Now psychological acts are made up of a number of different kinds which are really distinct, differing from one another by their special relation to objects.¹²¹

^{us} See above. Second Thesis, C.

— Operative potencies, therefore, constitute as many really distinct kinds as there are kinds of acts, i.e., as there are objects, which are "formally" distinct.

St. Thomas recognizes the following :

sensitive powers. Their object is individual matter.

a. *Cognitive powers.*

1) *External* senses (of which touch is a specific kind)... but as present to an organ and modifying it.

2) *Internal* senses, ¹²² but only insofar as perceived through the external senses.

a) The *general sense* (*sensus communis*), the perceptive sense, grasps its object in a synthesis of differing qualities.

b) The *imagination* grasps its object as represented.

c) The *memory* grasps its object as past.

d) The "*estimative*" sense grasps its object as concretely useful or harmful.

b. *Appetitive powers.* The appetite is twofold : the concupiscible appetite desires a concrete object as agreeable, whence the emotions of desire, pleasure, fear, hope, impulse; the irascible appetite combats a concrete object as harmful, hence the emotions of revulsion and anger.

intellective powers. Their object is being; their proper object is the universal grasped in the sensible.

1) *The powers of knowledge.* The two *intellects* : the possible intellect which knows by reason of the agent intellect which illumines the universal in the image.

2) *The power of desire:* the *will* with its passions derived from the love of the good in general.

ia In scholastic terminology, the internal senses are not to be considered as those whose organs are situated in the depth of the tissues, but rather those whose excitation, we would say today, have a central origin, those which find their object in a previously sensed object which they elaborate. See *Summa Theol.*, I^a pars, q. 78, a. 4; Skrttilanges, *St. Thomas d'Aquin*, t. II, p. 128 ff.; E. Gilson, *The Christian Philosophy of St. Thomas Aquinas*, pp. 204-206.

We must add a *locomotive power*, a complement to the appetitive powers and a projecting of their psychological action into mechanical gestures.

It is quite possible that this list is debatable, but its principle is uncontestable, and its broad lines have been verified in the second thesis. To refuse to make a distinction between the powers after having made a distinction between the kinds of acts would be to forget that powers are only the passivity of the ego in relation to its acts, and that its *diverse* aptitudes are actively directed towards objects.¹⁸³

But doesn't a real distinction between powers break up the unity of the ego? In no way, for this distinction is only :

2. *relative*. An *absolute* distinction is one which opposes existences, i.e., substances. The *relative* distinction links together again that which it separates. With this distinction we find the operations of the ego differing, but nevertheless interdependent; the qualities of the ego heterogeneous, yet determining one and the same substance. This is the way in which the powers are distinguished : they compenétrate each other and are qualities of the same ego. Sight serves imagination, and it, in turn, serves thought. All are at the service of the will in which the unity of the ego is most apparent.

The powers are, therefore, not *things*. They do not each have an existence of their own. They are the same ego, which alone is properly endowed with existence. It is by their relations to acts that they are distinct and multiple. To recognize them as such is not to deny the unity of man. We simply assert that man is complex and rich in varied directions, but nevertheless he is organized, or at least capable of being organized into a harmonious synthesis, through the free thought which governs these powers.¹²⁴

“* See above. Third Thesis, B.

* The task of moral living is precisely the determining of an order of values, and therefore one of potencies and acts, and then it is one of realizing that order in an equilibrium that is always more and more harmonious and stable.

But if the problem of psychological becoming has found a solution in the theory of powers, this solution only gives rise to a new problem. *How understand this man, who, at the same time, is one in his substance and multiple in his powers?*

What ought to be t h e s u b s t a n t i a l n a t u r e o f m a n ?

Chapter hi

THE SUBSTANTIAL UNITY OF MAN THE RATIONAL SOUL

Fourth Question : *What is man?*

Fourth Thesis : Man is

1. *one substance, with a unity of nature and Person',*
2. *yet composed of prime matter and a substantial form which is an intellective soul',*
3. *prime matter is organic in him, by virtue of an INTELLECTIVE SOul*
4. *the intellective soul is spiritual in itself as well as subsistent;*
5. *yet it is a true substantial form, and therefore there is only one substantial form in man, which is strictly individual in each man. It is essentially and completely simple, and present in every part of the body.*

A. The problem of man's nature.

1. It can be posed in two ways.

a. Man is an *object of experience*, a phenomenal ego. He appears to himself as a subject of multiple qualities (First Chapter). Like every' object of experience, he undeniably exists, but what is his essence? What must he be *in himself*, to be able to experience himself through consciousness as he does? *Is he really such as his consciousness shows him to be?* If he is not, then what is he, and how is he shown to be other than

what his consciousness indicates? If he is, then how can we conceive him as uniting in himself the apparently contradictory attributes which are revealed through the analysis of psychological events : a single subject, with multiple acts; an identical subject, with constant}' changing acts; an active subject, whose acts are dependent on objects? Under this form, the problem is one which concerns the *critique of knowledge* and *ontology* : what is *the being* which is attained through *the knowledge* of consciousness?

b. On the other hand, man is *a becoming*, a being realizing itself in a temporal duration. What is this supple reality, which constitutes him such as the second chapter has shown him, potential and mobile, assimilating material things, yet transcending them with a universal idea; active not only in gearing his movement to the exigencies of his physical environment, but also in creating his proper direction by a free will? Under this form, the problem is a *metaphysical* one : what is the nature of the *subject who*, in the reality of man, *becomes*?

In its two forms, the problem remains one about the substance of man. From the moment we suppose, as common sense does, that man is a being *endowed with existence in himself*, and because of that, *capable of knowing*, acting and *changing*, the problem is posed. Sometimes philosophers refuse to accept the problem when it is posed in this fashion because they refuse, in the first place, to see substance in man.

2. the philosophical SOLUTIONS can not help but reflect the differing attitudes taken in metaphysics about the nature of thought and liberty, as well as those taken in the critique of knowledge on the value of knowledge.

a. THE EXISTENCE OF SUBSTANCE

1) *Phenomenalism*. According to *Hume*, the problem born of the notion "substance" is a false problem. His empiricism leads him, as a consequence, into phenomenalism (see E. B a u d i n , *Psych.*, pp. 126-128). "All the perceptions of the human mind can be put into two distinct classes, which I shall call impressions and ideas.... By the word *impressions* I understand all our sensations, passions and emotions, considered as they make

their first appearance in the mind. By *ideas* I understand the feeble images which impressions leave (* Treatise on Human Nature ")■ To quote Hume again : " We have no idea of an ego.... From what impression could it be derived?... For every idea about the real, there must be a corresponding particular impression in which it has its origin ; now the ego or person or mind is not a particular impression at all.... If there were an impression which would give rise to the idea of an ego, *it would have to continue being invariably the same throughout the course of life*, since it is thus that we suppose the ego to exist. Yet there exists no constant, invariable impression.... When I penetrate the deepest part of what I call myself, it is always to light on one particular perception or another... I can never reach an understanding of myself without a perception. Thus only phenomena experienced as so many distinct impressions are real. Their fusion is the business of memory, i.e., of association. This fusion is only a psychological appearance, and in no way the revelation of a substance. There is no ego-substance : the problem of its nature is a false problem. 12*

Evaluation. (1) This theory rests on the empiricist postulate that all knowledge is reducible to sensation. This postulate is a serious error, because thought, contrary to the empiricist postulate, by its universality can grasp the data of numerous sensations at the same time, and observe there the reality of duration, as well as that of causality and substance. (2) The arguments invoked show at the most that *I do not experience the ego as being absolutely immutable*, no more than I have an experience of an *ego — pure substance* (pure subject of existence). The arguments of the empiricists have some value against the mechanical theory of substance, for, if substance is a pure receptacle of movements, it could not be understood by grasping

14 See R. Jolivet. *La Notion de la Substance*, pp. 183-186. According to Hume, " the idea of substance is... a product of psychological association, without any objective validity.... The substantiality of the ego owes its origin to the memory. " Moreover, " after having reread the chapter on personal identity, he (Hume) had to confess that this lively feeling of personal identity remained unexplainable. "

movements which would be completely foreign to it.¹²⁸ These arguments have no validity against the Thomist doctrine of substance, for substance, being the very thing which changes, is grasped in every change. As a matter of fact, it can be grasped only in its changes, which are determined moments of its duration. To know it in itself, there must be a reflection, which directs the attention to the internal unity of phenomena, and to their reciprocal action, whether these phenomena be simultaneous or successive. (3) This *identity*, this *unity*, this *causality*, are actually data of psychological experience, and they are, at the least, as evident as the multiplicity, diversity and inertia of phenomena. As a matter of fact, the former are known before the latter, since we are aware of ourselves as one object among other bodies, before we are aware of the specific and individual distinction between conscious events. (4) Finally, *memory* can not be the cause of an ego which is pure illusion, because if the events in memory have the value of reality, memory must suppose a real ego, a *lived unity* of past and present, an *identity* in the subject who perceives the two simultaneously, an *activity* exercised by "yesterday" on "today."

2) *Kant's critique.* Kant was very much disturbed by the empiricism of Hume, but he recognized that there was a problem. Science and ethics are meaningless without the reality of the person whom they manifest, yet, according to Kant, the problem summed up in the question: What is the nature of the ego?

* The difficulty "rests in the conception... of a subject which is immune to change, on which qualities and accidents would happen... to be fitted tightly as clothes clinging to a body.... In order to admit a real distinction between substance and accidents and, consequently, the reality of substance, substance and accident must be related among themselves as one thing to another thing. This gross use of imagination actually makes the notion of substance unintelligible" (*ibid.*, p. rS6).

See pp. 186-191, and particularly " (The opposition) between the immobile and the mobile is a complete fallacy. There is nothing immutable in created substance. When the accidents are subjected to change, and the change is constant, it is the whole substance which changes, indivisibly with its accidents, yet within the limits of its essence." (P. 190). See also C. V. Salmon — M. A. OXON. *The Central Problem of David Hume's Philosophy* (Halle: Max Niemeyer Verlag, 1929), pp. 30-33. See also L. DE RAEYMAEKER, *The Philosophy of Being*, pp. 178-194-

cannot be given a theoretical solution. The reason is that *we have no intuition of the ego*, yet we cannot fail to think of ourselves as an ego, as a substance. But this is for another reason than that alleged by Hume. It is because of the "a priori" structure of our minds. The "a priori" category of substance allows us to construct the objects of experience and know them by representing them as subjects of our judgments. These subjects, however, are not absolute, and each can become the predicate of another subject. Our reason is, therefore, led to believe that this putting back of a subject as predicate to another subject, which can also be so conditioned, is a process which can not go on into infinity. Thus we must arrive at a subject which is unconditioned, i.e., no longer an idea *conceived* as substance, but a thing which *exists* as substance in itself.¹²⁷ Now, according to Kant, this is an illusion because the category of substance, like all the "a priori" forms, carries a guarantee only when it is used within the limits of experience, and there is no experience bearing on existence in itself. Consequently it is impossible to answer the question: What is the nature of the ego-substance?

The third antinomy 1,8 shows in a particular way that the admission of the possibility of a solution leads to the assertion that two contradictor)' conclusions are equally necessary: (1) We must admit, over and above natural causality, the existence of a free causality, for only liberty can be an absolute cause (first), and there must be an absolute cause in order that there be natural, determined causes. (2) Such a free cause can not exist, for to cause in an absolutely free fashion would be to cause without a sufficient reason.

127 Science admits that there are substances, e.g., water, but in a completely relative sense. It thinks of water as substance actually, when it relates the properties of water to it. However, science can think of water as formed from hydrogen and oxygen, and therefore thinks of it as an effect or a simple phenomenon. It can even make the notion of substance disappear at the level of the atom of hydrogen or oxygen by conceiving it as the result of a certain arrangement of sub-atomic particles. "Substance" is thus only a way of conceiving phenomena.

1,8 This antinomy directly concerns God, but it can be made to have a value in regard to the ego.

This antinomy must lead us to the rejection of a theoretical solution, but the field is left open to a practical answer. Moral action demands my belief in my liberty and in the immortality of my person. This belief finds neither proof nor possible refutation in theoretical knowledge. It is a reasonable belief, however, because of its necessary connection with moral action.

Evaluation. (1) This position is a logical consequence of the doctrine on a priori forms. Now this doctrine is meant to answer the question: Under what conditions is a *scientific* explanation possible? To apply this doctrine, even if it were true, to a *metaphysical* explanation would demand this conclusion: theoretical metaphysics is impossible, because both a scientific and metaphysical explanation are specifically different. That amounts to saying: A metaphysical problem cannot be solved by specifically scientific methods and principles. Kant's mistake is in believing there are no others. — (2) As far as his *denial of any intuition of the ego*, we can only reproach Kant on the same grounds that we do Hume. It is true that I have no intuitions which reveal my substance as a completely existing thing devoid of an accidental determination. Rather this intuition reveals me as a synthesized reality having a substantial unity. †# — (3) *The practical solution* is a *pseudo-solution*. It simply transfers the question from the theoretical order to the practical order. Is not the categorical imperative an illusion, if I am not *really* a liberty? — (4) To resolve this problem, Kant makes a distinction between two orders of reality: *the phenomenal ego* (the ego of experience) lies in the realm of necessity; it is in *the noumenal ego* which is not the object of experience, but of belief, that liberty is realized. What then happens to the unity of man? If this be true, then moral action has no foundation for *liberty must exist in phenomena* under pain of having no moral order at all. *†

Thus the arguments of Hume are impotent to nullify the existence of substance in man. The Kantian arguments suppose

*† L. de Raeymaekers, *The Philosophy of Being*, pp. 190-194. See also R. Jolivet, *La Notion de la Substance*, pp. 209-225, especially 213-215 and 222.

See E. Baudin, *Psychologie*, p. 596.

it in affirming the idea as natural to reason. The last word must be found in

3) *The experience of consciousness*, as it is revealed to us by common sense. The ego appears to itself as being a *single, identical, and active* subject. This it *really* is, and not simply in appearance. It is a substance, a subject of existence, not, however, fixed and immutable, but existing and becoming at the same time. There can be no reason to deny the truth of this affirmation, unless the evidence of consciousness is found to be faulty, or unless reason proves its content to be involved in contradiction.

a) The study of "mental aberrations" seems to show consciousness as a rather untrustworthy witness, and one which can often enough contradict itself. One and the same subject can believe himself to be two distinct personalities, whether simultaneously or alternately; but for every sound observer, there is only one person.

(1) Admitting by hypothesis that in these cases there is no fraud or exaggeration on the part of the one who is mentally ill, but that we are facing a question of delusion, what can we conclude? That all the testimony of consciousness is without validity? Strain as we may to see in the night, nevertheless, we are often deceived about colors and distances. We have only then to determine whether the *conditions required for perception* are realized in those circumstances by comparing them with those which are presently realized in reading this page.

(2) These instances show that the *consciousness belonging to the ego is not innate or acquired in all its perfection and in its whole extent in one fell swoop*. It is differentiated little by little and it can very well ignore real facts. These instances show that we have no intuition of the ego-substance in a pure state, but in no way do they prove that all intuition concerning the original data of the ego is denied to us. (3) These instances even show intuition as revealing the simple data of the unity, identity and activity of an existent being, of a substance with all its particular

determinations. Where else do we have as clearly a complete and simple experience of substance as we have in the experience of our own psychological life? This idea is present, and with it the ideas of unity and identity, even in the mentally ill who think of themselves as two different persons. Actually, *they use these ideas* when they attribute to the multiple "ego" their acts and gestures. Therefore, not one of them experiences a pure phenomenon. Each one grasps a phenomenon as experienced by a subject, and that is why he attributes it to a subject. The appreciation of the number of subjects is one fact; the attributing of a phenomenon to a subject is another, and a very different one. The first operation is far less primitive than the second, and the error in the first does not lead inevitably to error in the second. These mentally ill people are faulty observers of the *frontiers of personality*. This may be so, but they are not, by reason of that, excluded from being valid and true witnesses of the *existence of the person*. (4) Finally, every observer who examines the lives of those afflicted with this type of mental illness, finds them to be *subjects who have a real unity*. The events which are attached to a first personality, form with the others, which, in the judgment of the subject, are detached from it, a *single real thread of existence*.¹³² For example, association pays no heed to the errors of personalization of mentally ill persons; both conscious and unconscious elements are involved in these associations. Now association presupposes *an internal unity of phenomena*, and the activity of one on the other from within a "metaphenomenon," called substance.

b) The testimony of consciousness can be denied in a second way: show that its content is contradictory. This can be done if the conciliation of all the characteristics of the ego

¹³² See Maqvart, *Elementa Philosophiae*. II, pp. 491-494, and especially note 2 on page 494, where he cites Binet on sicknesses of personality. "The split-consciousness, such as it exists in hysteria, is not made up by a sudden demarcation, which cuts off all relation between the two consciousnesses. Far from it, the psychological phenomena of each group exercise an incessant influence on the neighboring group, and the split in consciousness does not even suspend the operation of association of ideas."

into one, especially its being and becoming, proves impossible. The possibility of this conciliation constitutes the problem of the substantial nature of man.

b. THE NATURE OF SUBSTANCE

Monist solutions can be eliminated by a study of psychological facts : man is neither angel nor beast; neither completely spiritual, nor completely material. He is simultaneously material and spiritual in his fundamental operations. Without matter, i.e., without extension, he is not a man. This is what *idealism* forgets. What *materialism* forgets is that a being, riveted to the material, incapable of thought or knowledge of all being through the universal, stripped of liberty by which it can desire all good through partial goods, is not a man. Since the nature of man must be *dualistic*, how can we conceive this mixture, this union of matter and spirit?

B. The unity of man is substantial. This is the implicit belief of common sense, as well as that of all philosophers who accept the problem of substance as a real problem. Often they even explicitly affirm this substantial unity. However, the logical consequences of their doctrine sometimes belie it.

This is the case in some dualist doctrines which misconstrue the role of sensation in the formation of the idea : the body is a part of man, but it is of no use to the soul which lives the life of a pure spirit.

Thus, *plato* conceived the union of body and soul to consist in a movement which the soul communicates to the body. He compares this union with that of the musician in relation to his instrument, or that of a pilot in relation to his ship. This union does not belong to the nature of the soul, almost does violence to it, and curtails it. The union is accidental and consequently transitory. The cause of this union is not natural but must be attributed to a wrong use of liberty. This idea will be accepted by *St. Augustine*; *Duns Scotus* delights in explaining that our thought has its origin in the sensible, because we are in a fallen state which must be attributed to the effects of original sin.

Descartes sees the union of the soul with the body in the same way. The soul is united to the body because it acts on it. He definitely asserts that this is a substantial union, but his whole doctrine shows that it can not be. The body is only extension and mobility, and is a complete substance (mechanism). The soul is only thought, knowledge of immutable truth; it, also, is a complete substance in which nothing would be lacking, even if we supposed the body to be suppressed. The union of two complete substances will never yield the total of one single substance.

Malebranche does not resolve this difficulty by making God the basis of this union. Undoubtedly God can *move the soul on the occasion* of the changes which He effects in the body. This can be done in such a way that the movements of the one will always be in accord with those of the other; but this explains only a *correlation in becoming and not a unity of existence*. The body remains pure extension, and the soul pure thought.

Leibniz is not any more successful by having recourse to God in another way, by making the soul a single monad dominating the body which is an infinity of dominated monads. This combination he calls one single substance. Now, it is true that *the harmony reestablished* by God between each of these monads in the universe and the states of all the others explains their movements as a whole, much as the signal of a leader assures simultaneity and order in the maneuvers of an army. But the Leibnizian explanation of man supposes a plurality of monads and excludes man from having the unity of a substance. Man is nothing more than a society of monads "ruled" by the soul, and this is even saying too much, since the monad-soul does not act on the other monads of the body. Leibniz ended up, moreover, by admitting a new reality, which he called the "*vinculum substantiale*"; but this was to take away from monads the characteristics of substances.

Spinoza also speaks of a substantial union between body and soul, which is realized *by way of knowledge*, and no longer by way of action. *The soul is the idea of its body*, and it is a

thought which exactly corresponds with and is *parallel* to an extension. The unity of these two is found in God. God is the unique Substance, infinite and perfectly simple. In Him, extension and thought are necessarily identified. These two *attributes* naturally unfold in an infinity of finite *modes* which are bodies and souls. These modes are rigorously parallel, since they are basically one and the same substance. Man then, according to Spinoza, is truly one substance, but he has no other substantiality than that of God. If extension and thought are ultimately united, it is because they are no longer the completely heterogeneous substances which Descartes made them out to be. They are simple objects of the Divine Intelligence.

Thus *Cartesian dualism* is forced to acknowledge its inability to base the unity of man on his substance. It would like to assert a unity of substance as a basis for the unity of consciousness, but it founders when it begins to explain in what this unity consists. There is nothing amazing about this, since Cartesianism is above all a mechanism and bears all the weaknesses of it, particularly its inability to make the individual unity of beings intelligible.

How can we state this substantial unity? In two ways, since we can consider substance under two aspects, i.e., as *essence* or nature, and as *existence in itself* or subsistence, nature is substance, considered as being the first principle of a being's operations, subsistence is that aspect of substance, which considers it as having existence in itself, an existence which is possessed and exercised in action in an individual and incommunicable way. Now, under the two aspects man is one single substance.

1. He is, first of all, one single nature.

For the unity of the first principle is the necessary and sufficient reason to explain the unity of acts which flow from it.

Now psychological acts possess an organic unity, which fuses them together in one single movement which is simultaneously psychological, physiological, and physical.

Therefore, the first principle of psychological acts (the nature of the subject of these acts) is one.

The first proposition is evident to reason. Multiplicity cannot be the sufficient cause of unity. Undoubtedly, it can happen that a single effect can have several causes, but no one of them can be the sufficient reason, nor can it constitute the first principle of the effect, except one which unifies the others. Wherever, then, acts have a real unity, although they be as numerous and diverse as can be imagined, they must be derived from a principle which is really one.

The second proposition is a summary of common experience and of all the analyses we have made up to this point. Man *senses* as a man, not as an animal. In him sensation tends to be completed by the conception of the idea and judgment. Inversely, he does not *think* as a pure mind, but as a man. His ideas find their original content in the sensible. In like manner his affectivity is mixed. It is simultaneously corporeal, psychic and spiritual. It is natural that his actions be directed by his ideas, and free will can make its effects felt even in the physical and chemical changes of the organism.

It can be objected that psychological acts are of very different kinds. Knowing, acting, enjoying, can be either spiritual or material functions. It is exactly this diversity which brings out so clearly the strength of the link which binds them in a single movement, in a single duration, in a single life, and groups them together in a mutual dependence that is both causal and final.¹³⁴ Can we give an instance of such a compénétration of acts? If we take the most spiritual of ideas, that of God, we can see that it rests on the most ordinary ideas, those of cause, of dependence and independence, of mind and matter, etc... and these ultimately rest on images and sensations. Here, then, is the idea of God, which must suppose that my body is in operation at the same time as my soul. The origin and the understanding of this idea of God is not open to arbitrary solution, as mysterious as it may be, for all my knowledge is linked necessarily in a definite and unique fashion to sensation. The nervous system acts only on the presupposition of all kinds

^{1,4} See above. Second Thesis, F.

See above. First Thesis. D.

of biological, chemical, physical and mechanical activities which, in turn, presuppose an extension within which they are incorporated and realize their effects. My nature as man is therefore not a pure thought principle. It is a principle which thinks, blended with a principle which imagines and senses, which lives, and which moves the extension which is my body.

Thus, man is an extended being, endowed with corporeal, vital, animal, and rational qualities. There is his nature, and it is *one*. That which is not one, is our manner of expressing that nature, because our knowledge, being abstract, can only express the richness of a unity by multiplying our looks at it. The greatest light is shed on the basic unity of human activity at that point where sensation and thought meet : *the proper object of human intelligence is grasped in the sensible*. All that sensation supposes and synthezises, from the movements of electrons at the interior of cells, all that flows from the vision of the universal, to the most heroically spiritual free act, is condensed in this definition : *man is a rational animal*. Man, who is both material and spiritual, is *one single nature*.

2. He is also one single person, and he has existence in himself, which is incommunicable, indivisible and *truly one*. Every subject which exists in this fashion is called an "*agent*" — *individuum subsistens in aliqua natura*. — An agent which is endowed with an intelligent nature is called a "*person*," — *rationalis naturae individua substantia* — according to our traditional definition. Man is one person, if his existence is his in an incommunicable, unique and indivisible way, and without any doubt it is.

In general we may say that existence is revealed through action. The incommunicability of existence will, therefore, be seen through that of action. 188

a. Now *ordinary* experience attributes all psychological acts, as well as all physiological operations and the actions or physical states which have the body as their own theater, to a single subject, the "I." The physical ego is one with the

Actio est suppositi.

psychological ego : *I* will, *I* see, *I* walk, *I* am standing. There is only one existence and it belongs to me alone.

b. A simple *reflection* on experience will be sufficient to justify this observation. The belonging to self is not simply a privileged characteristic belonging to consciousness, for it is already a characteristic of physiological life and of the simple existence of bodies in their physical individuality. Evidently, this belonging to self appears under different modes : in rational consciousness under the form of liberty and responsibility; in the organism under the form of immanence and biological egoism; in the body under the form of spatial limit and specific forces. Now in man these are not three existences in himself. There is only one and the same existence which is the basis of inseparable activities. To separate them would be to destroy man. Only death realizes this separation.

All man's actions are, thus, the manifestation of a unique existence, which is at the same time incommunicable, i.e., closed in on itself. Man is one single agent, and, since he is conscious and free, one single person.

C. Nevertheless, the substance of man is composed.

As far back as we can go in time and even among those who are least civilized, e.g., pygmies, the judgments of *common sense* assert that man is a composed being. For primitives, there is a kind of invisible man, who ordinarily dwells in the visible man, yet sometimes gets free from him, as in dreams and in death. This is the *soul*, a name drawn from the breath, which indicates its vivifying role.

The distinction made here between the body and the soul lacks *philosophical* precision. The tendency of reason to unify, the reflex consciousness of the unity of man, have forced some philosophers to reduce the soul to body — such as the materialists have done — and others to reduce the body to soul — such as the idealists have done. However, such a unification must deny the irreducibility of sensation and thought. There are also very many philosophers who profess a dualist spiritualism and endeavor to understand clearly the respective roles of body and soul in man.

The *classic dualism* is that of Descartes. It makes of the body and soul *two complete substances*. Body is pure extension, pure receptivity in relation to movement. The soul "by which I am what I am" is "a substance whose *entire essence* or nature is *thought alone*" (*Discourse on Method*, 4th Part of the 6th Meditation). This dualism can not be true, since it makes the substantial unity of man impossible. Therefore, we must interpret the dualism of body and soul in another way; we must mitigate it, in order to respect the distinction between sensation and thought, and yet retain their functional unity, as well as the unity of the human nature and the human person.

The *Aristotelian dualism*, hylomorphism, contains the essentials of a solution. St. Thomas had only to correct it by making the doctrine on the spirituality of the soul clearer.

Here, extension is not the substance of the body itself. It is only a necessary derivative of substance, and moreover, it is never the sole property of it. Extension is found in the body, determined statically and dynamically by qualities and forces which are also derived from the substance of the body. Thus, concretely, all extension is specified and endowed with a definite spontaneity and finality. Extension conceals itself as an incorporated idea. The corporeal substance, which is the dynamic center from which spring these properties, can not be simple. The reason for its extension is a principle of passivity and indétermination, *prime matter*. The reason for its qualities and its specific activities is a principle of determination, analogous to a plan or a directing idea, *substantial form*. These two principles are complementary¹ and fuse together in one complete thing in such a way that what is determinable (e.g., the subject) and what determines it (an attribute) make only one determined subject; in such a way that, what could be and what is now, after having become (potency and its correlative acts), make only one complete being, one being "in act."

In such a doctrine, *man is no longer an exception* in nature. He is in conformity with the general structure of corporeal

¹• See E. Gilson, *The Spirit of Medieval Philosophy*, chapters 9 and 10.

nature. He is a body which has thought as its specific characteristic, just as some other body might have as its specific characteristic its atomic structure (e.g., H and He), or molecular structure (e.g., HCl and NaCl), or its morphological type (e.g., an oak and a beech). On the other hand, this doctrine is supple enough *to respect the spirituality of the soul*, by making it necessary to man, and by indicating its place in an overall plan. Such considerations, as we have just made, lead naturally to a theory' of a *hierarchy of forms*. This theory supposes that in the mounting degrees of being there is a gradual triumph of the idea over the matter in which it is incarnated. The *mineral*, being the lowest degree, realizes its type (its idea) by diffusing it throughout extension wherein differences are minimal. If a mineral has an existence for itself, it is above all for the universe, or for others,, because whatever *activity* it possesses is of a *completely transitive character*. The *vegetable* realizes its form within its proper extension. The form already belongs to an individual by virtue of its *immanent action*. It possesses this type or form, however, only in extension, and is not aware of this possession. The *animal*, on the contrary', comes to *know* something of what he is and what others are. Through knowledge he acquires the determinations (the forms) of others. Nevertheless he remains rooted in the individual, *subservient* in his knowledge *to the limits of the extended*. Finally, *man* liberates himself from spatial and temporal limits, he is *conscious* of his universal nature and of his environment, and because of that he has *liberty*.¹³⁷ However, this consciousness and this liberty are exercised in a world of bodies and through the intermediary' of sensations. By' this, man remains a citizen of the universe. Beyond this, we can conceive of a continuation in the direction of the spiritual : but we must, in such a case, postulate a thought and liberty which no longer receive their object from material things, and which will, therefore, be the attributes of a " form separated " from all matter, i.e., a pure spirit.

Read E. Gilson, *The Christian Philosophy of St. Thomas Aquinas*, ch. 4, pp. 187-199.

The proofs of hylomorphism have a general import and are valid for all corporeal beings. They necessarily include man,, insofar as he is a corporeal substance. Let us see how they apply to man as such.

1. The substance of man is a composite of potency and act. The substance of man is subject to change to its very core. The birth and death of man are facts, and they are *substantial changes*. Plato and Descartes prefer to see in these facts no more than a hitching and an unhitching of two substances. We must insist that only one substance begins, and one substance ceases to be. However, it is likewise evident that something of that substance existed before birth, and something of that substance will exist after death. Man is born of the flesh of his parents. A dead man furnishes us with something, " what I do not know, something which has no name in any language. " Here there is neither total creation nor total annihilation, but a substantial becoming. Consequently, the substantial principle capable of becoming this man is called *potency* and the substantial principle that makes him this man is act.

2. The correlative potency and act which constitute the substance of man are prime matter and substantial form. The indetermination and the absolute determinability, which characterize prime matter, are revealed in every' corporeal substance by the indefinite divisibility and passivity which are the properties of its extension. Now they are not revealed in man simply under this general aspect; they are here marked with a characteristic which is specifically human.

a. extension is a requisite in the make-up of those organs which are most involved in strictly human function, such as the cerebral cortex and sensory apparatuses which are the indispensable servants of reason and human liberty. Extension is supposed in the social life, which educates persons, as a means of separation and the bond of communication. Extension shows itself in man under very' precise determinations. *Consciousness depends on these limits* to distinguish the ego from the non-ego, to distinguish the internal from the external. And

yet extension keeps its indefinitely divisible and determinable nature. We must, therefore, recognize in human substance a pure potency, a prime matter, which is the proper principle of this pure indétermination.

b. passivity is realized in man under specific forms, as that of thought and of will. Now their passivity *is not limited*, in itself, *to such and such an object* (I am capable of knowing whatever is, and of willing whatever the object may be), nor is it limited *to such and such an act* (no thought nor any decision is innate to me). This passivity which is completely undetermined in both these specifically human activities imperiously demands an indefinitely determinable substantial principle, a pure potency.

Undoubtedly, the clearest evidence of pure power, which is directly observable, is that of typically human activity, which is spiritual. Let us, however, pass from the level of powers and acts to the level of substantial principle. Can we assert that the principle here involved is pure spirit, pure act? That is impossible. Will it be sufficient for us to say that this principle is linked to one which is vaguely potential? Not at all! Actually we are looking for a principle which conceals in itself the absolute determinability which is introduced into the phenomena which spring from it. Of course, it is through the intervention of sensations and images that this prime matter reflects its indefinite mutability in the spiritual world of minds and wills. But to think and will in a human fashion is possible only in a man — substance formed from an authentic prime matter.

c. the irreducibility of extension and the preeminently human qualities (operative powers) is more apparent than that of extension and corporeal qualities in general. On the other hand extension here appears more completely receptive because of the immanent and “intentional” operation of these powers. Extension is not only determinable by psychological qualities, it is also indirectly the support of those qualities which are in the objects we know and love. Human substance must, therefore, be formed of two distinct principles. One of these is pure potency with regard to not only

all strictly corporeal forms, but also to a type of substantial form, which is partially incorporeal, and of which certain operations are spiritual.

3. This substantial form is an intellectual or rational soul.

In general, the soul is the form which organizes and makes prime matter a living thing. It is not a vegetative soul or an animal one which is the substantial form of man. It is an intellectual soul, i.e., a soul, which is a principle of thought and liberty.

In fact, the substantial form in a being is the origin of its specific properties.

Now, the specific properties of man are the intellectual operations of knowing and willing.

Therefore, the substantial form of man is a soul, a principle of life, and an intellectual soul.

One could object against the minor premise that there are natural properties of man which are irreducible to thought and will, e.g., sensations and physiological operations. It is true that sensations and physiological operations are natural to man, and while they are not reducible to thought or to will, they are the preparation for it and are "a fortiori" implied in the intellectual power. The form, which must consider by abstraction and will objects presented through abstract ideas, demands sensation and all those organic functions which sensation supposes as properties. Consequently the biological structure of the body and its physico-chemical activities must be understood as functions of a rational form.

D. Would, then, the organization of the body be the *result of a union between an intellectual soul and prime matter*? It most certainly would, because :

The nature of an existent being demands all that is required to make possible the operations which are proper to it.

Now corporeal organization is required to make possible the operations which are proper to an intellectual soul.

Therefore, the nature of the intellective soul in its existence demands corporeal organization. In this sense, it is the soul which organizes its body.

The major premise is only an explanation of the notion of "nature."

The minor is a collection of truths drawn from experience. The proper object of thought, which is the specific operation of the human soul, is actually a universal, but a universal *grasped* originally *in the sensible*. Neither thought nor human will are possible in a soul which does not sense. Moreover, no sensation is possible at all in a soul which is "separated" from matter, which is without cells, without sensory apparatus, in a word, without organized matter. Thus the human soul is not capable of its *specific* operations, abstract thought, free will, without corporeal organization. In order to realize the abstraction of the universal, which is its proper work, the soul absolutely demands organized matter.

But to demand it is to realize it, otherwise the soul would not be a real nature, but only a possible one. It would lack that which is necessary for it to be. It would be only a name given to a fortuitous result, the result of an organization to which it would be a complete stranger, and which, being found there by chance, would allow the abstraction of ideas as a casual game suggested by the circumstances, in a word, as an amusement. This is not so. The organization of man's body has its source, its reason, in the *proper finality* of the soul, since it is *natural* for the human soul to abstract the idea from the image.

Consequently, we can say that the empirical formula of the union of the soul and the body lacks precision. The body about which we are thinking is naturally our physiological organism, that which different sensations, the kinesthetic among others, reveal, which biology studies and medicine is obliged to heal. This body is not prime matter. Properly speaking, this body is the substantial composite such as we find it among animals and which Descartes identified with extension. But the union of a soul to such a body would only be accidental. To safeguard

the substantial unity of man, we must here understand "body" as synonymous with prime matter, and see in the intellectualive soul the principle of all the corporeal determinations of man.

Difficulty : Scotus, however, and his disciples, the majority Franciscans like himself, give the empirical formula a completely literal interpretation. The organization of living bodies is not derived from the soul, but from a special form called "forma corporeitatis." The principal argument is an empirical one based on the permanence of the organization for some time after death. At this moment, they maintain, there must be a "cadaverous" substantial form of one kind or another, which maintains the organs in their structure, if not in their function. Now this structure existed in life, and even existed before life, being the very condition of it. It, therefore, does not have a reasonable soul as a principle, nor any soul at all, but only a simple substantial form which gives to physiochemical elements the structure required for life.

The probative force of the above argument seems to rest on our forgetting that substantial changes, which are instantaneous in themselves, are only *single moments* in the course of local movements and alterations, and *they can not be isolated from those continuous movements* which precede and follow' them. Before the existence of a newly constituted substance, certain qualities, certain structures ought already to exist, which are the specific properties of the future substance. They are necessary by reason of the "dispositions" which are natural to prime matter, from whose potentiality in nature a definite

*• E. Gn. so N, *Jean Duns Scot*, p. 490-497, makes clear the position of Scotus. The penetrating Doctor requires "the presence of a 'forma corporeitatis' in the case where no higher form is any longer present." What are these cases? "When an animal dies, his body remains. After the departure of the vegetative soul, a form of corporeity remains. The form, by virtue of which a body is a body, is other than that by which it is living" (p. 495)- But where is it during life? "The intellectualive soul truly animates and informs the body even in its least parts" (p. 496), containing in itself the perfection of the lower forms, which, nevertheless, remain formally distinct from it. See also C. R. S. Harkis, *Duns Scotus*, (Humanities Press : N. Y., 1959). Vol. I. pp. 158-159. See also E. Bktt oni. *Duns Scotus*, pp. 67-76.

kind of form must emerge. Moreover, when the substance has ceased to be, all the qualities which found the reason of their specific stability in it, do not immediately cease to exist. Some, like physiochemical activities, which have found a specific principle in the new substance, will continue to exist (chemical combinations follow their same general laws in a cadaver); others, like physiological activities, cellular multiplication and reflex movement, which do not have in the new substance a living center to which to attach themselves, pushed on by a natural finality, will pursue that movement of descent of which death is only one of the moments, and will finally stop, unless by chance or the artificial care of science, this movement of descent is arrested (growth of nails after death — cultivation of tissues). m To summarize then : if we consider (1) the relation of the existence of a substance with the accidental changes which precede life and follow it, (2) and the natural links which bind the substance to all other substances or at least to very many among them, we are no longer astonished that there already was an organization of matter before the existence of an individual human being (in the gametes whose fusion will constitute his first cell), nor that there subsists after death for a certain time, an organized cadaver, conserving some of its biological properties.

However, we must not fail to indicate the difference between these two organizations, which are anterior and posterior to human life, and the organization of the body during life. The two former are manifestly pure natural changes. There is no tendency in any of the gametes to conserve its rudimentary life in isolation, any more than there is in the cadaver to conserve its organization, deprived as it is of all combined operation, of all natural unity. The organization of the body throughout

“• In relation to cultivating life in organs, which have been separated from their living source, a great deal has been accomplished since the experiment of Carrel in 1937, when he succeeded in keeping a fragment of a chicken heart alive during a number of months. In 1947 science succeeded in maintaining functions already acquired by organs, even after they had been separated from their vital source. Recently, Professor Wolff was able to sustain embryonic development in a completely specific direction *in vitro*, over an allotted time. See article on above experiments in *Science et Vie*, February, 1955.

life, however, manifests a *natural unity*: (1) it builds itself up progressively according to a definite type; (2) it perpetuates itself, it mends itself. This unity is simultaneously one of structure and one of activity. Such organization demands as its sufficient reason the substantial unity of an organized body. It is this unity which is lacking in gametes and in a cadaver. It is, therefore, impossible to explain the organization of a living thing by an organizing principle which is a stranger to life. On the other hand, all is explained if we attach the preparatory and consecutive organizations to life, to the causality of a soul organizing the body which it vivifies. This soul is an intention of nature, one of the terms of its finality. Is there anything astonishing if there are ways which lead us to it, and others which take us away from it?

The Scotist position is, therefore, not at all necessary to explain the organizations preliminary or posterior to the existence of man. It is even false, because, in order to explain vital organization, it offers only an insufficient principle, completely and expressly invented to explain the properties... of cadavers. It is, moreover, dangerous, because it prepares the way for the Cartesian error and makes of man an incomprehensible amalgam of two complete substances, body and soul.

A new *difficulty* : Should we, then, admit that human *thought* is the architect of the body which it animates? — No. This would be to forget that thought is not the soul itself, but only one of its acts. It is by its essence that the soul constructs its body. It is, united to prime matter, a principle of existence as well as of life. It brings to extension all the properties necessary for the exercise of its most specific functions, among which is to be found structural differentiation.

How can this be? Because the soul is not an isolated being. Its dynamic unity is a part of a system of beings and movements which constitute nature. The soul does not have to reflect on the construction plan of its body in order to realize it. That plan is inscribed in thought and realized by the will, and is revealed to us in the idea of nature.^M When this plan is realized

^u See *Cosmology*. Eleventh Thesis.

with the causal collaboration of nature, it is *essentially because of the soul*; it is *to serve the soul* and *because the soul* has already vivified a determined part of matter. The organization of the body is thus the effect of the union of the intellective soul with prime matter. In no way is that organization derived from a special "forma corporeitatis."

By reason of this, the intellective soul fulfills the general definition of the soul given by Aristotle : It is " the first act which constitutes in matter an *organized* natural body capable of vital operations — *Actus primus corporis physici organici potentia vitam habentis.* "

E. Is not the spirituality of the soul compromised by this substantial union with matter?

1. If *we must recognize the spirituality of the soul as a fact.* This fact is inscribed clearly in the strictly spiritual operations which are the natural endowment of man. [4] The intellective soul is actually the source of them. If this principle depended essentially on matter, then thought and will would "a fortiori" depend on it. The dependence of the soul in relation to matter can, therefore, be only extrinsic.

A *capital consequence* results from the above distinction. Since, in certain of its operations, the soul is essentially independent of matter, it must also be so in its existence. It is, therefore, "subsistent in itself," a subject having that which is sufficient for substantial existence, capable of existing in itself, once its union with matter is broken. "Operatio sequitur esse." Acting is only a way of being, and dependence in being involves dependence in operation. The soul is spiritual in its operations. It is, therefore, "a fortiori," spiritual in its existence.

2. *Can this fact be understood?*, i.e., can it be reconciled with the role of form which is natural to the soul?

a. *This seems impossible.* (1) The substantial form is, generally, exactly and reciprocally adapted to the matter, in

such a way that it is individuated by it, while this same form communicates its specific determinations to matter. Thus the form seems to be always dependent on matter and incapable of existing alone. Substantial existence appears to be reserved to the composite. (2) Usually the substantial form demands properties. Nevertheless, these properties are not its *onto*, but belong to the composite. It is the composite which acts and undergoes influences. But, if the soul is spiritual, it itself must act without depending on the body. Then it would be the soul which thinks and wills and not man.

This difficulty is the reason why Averroes insisted on the separation of the agent intellect from all matter. A form which is united to matter can not be spiritual. This is also the reason which led Descartes to define the substance of the soul as thought alone. The same difficulty, exploited in a different direction, is the most serious for materialism : a soul which is so closely linked to a body must necessarily be material.

b. *Let us remark*, in the first place, that all these reasonings are guilty of the same fault of transforming an obscurity into an impossibility, an error into a negation. I do not see how the two facts are united, so I conclude that they are not united, or that I must reject one of them, either the soul-form or the soul-spirit.

This obscurity, however, can be diminished by taking a look at the ensemble of corporeal beings and at the theory of the *hierarchy of natural forms* which such a look will demand.

This hierarchy is *symbolized* in the "natural" biological classification, which is based on a progress of organic differentiation at the same time as on the chronological succession of species.

This hierarchy *»s expressed* in most metaphysics under the form of a law of continuity. Thus Leibniz makes the law of continuity a hierarchy of monads, i.e., a hierarchy of degrees of consciousness, as Plato made of it a hierarchy of ideas.

The *general law of forms* is that the higher form demands the properties of the lower forms and adds its own to theirs, not by an extrinsic numerical addition, but from within by an organic

continuation and as if by a vital evolution. Thus the animal does not add the power of sensing to a power of "vegetating" which would be totally foreign to it. The animal differentiates vital power beyond the nutritive reaction responding to an excitation of the environment; it *perceives* an excitation and, by anticipation, it *imagines* the motor response. Similarly, through abstraction, man infinitely prolongs sensation and image into thought. Thus it is clear that the powers of the soul may be of two orders, without the soul being divided in two, since these two orders are ultimately one, because of the subordination of one to the other. The powers of sensible life are proper to the soul, as it is the form of the body; the intellectual powers are proper to the soul, as it is spiritual and subsistent. However, it is not one without the other; it is form only in order to be spiritual, as it is true that it senses, imagines and desires because these are necessary for thinking, knowing and willing.

To sum up : the difficulty arises from our general application to all forms of what is true only of forms which are completely "informing." The natural hierarchy of forms, however, invites us to believe that there is a possible summit where a queen-form, without abdicating her royal power over matter, but rather because of it, begins to rule over the empire-of-self through consciousness and liberty. This notion of the natural hierarchy of forms pushes us even farther by forcing us to ask ourselves whether corporeal nature would have a sufficient reason for existence, a why, without this crowning event which takes place in it and through it, the incarnate spirituality of man !

3. AS A CONSEQUENCE,

a. all the operations and all the essential determinations of man have their principle in the intellective soul. For *some* operations, however, this soul is an impotent principle without matter. These are the operations and determinations of the composite, as is the case with nutrition, vegetative functions, sensible life and all its manifestations. *Others* have the soul alone as a principle, even though they find their natural condition of exercise in sensations. These are the spiritual operations of knowledge and will.

The materiality of sensation and the spirituality of thought have thus two correlative aspects, one objective and the other subjective. For a material object, there must exist a corresponding knowing principle, a material subject (the composite); for an immaterial object an immaterial subject (the soul).

b. Man *exists* with the same existence which is proper to his soul. (The soul confers existence on the body). In other hylomorphic composites, it is the composite which exists in itself, the form only having existence through the composite, since form in these cases is not subsistent. However, in man, the soul can not depend on the composite for its existence. Now, this composite can not have an existence in itself, distinct from that of its soul, for then this duality of substantial existences would make them two complete substances. Thus, the substantial unity of man joined to the spirituality of his soul involves the following consequence: the only existence of man is the existence which he has from his soul.

F. The role of the rational soul is certainly that of a SUBSTANTIAL FORM.

Since this role is reconcilable with its spirituality, there is no other consideration standing in the way to oppose this assertion. This point, however, has fruitful consequences, which it might be useful to dwell on.

1. The rational soul is a substantial form *in the true sense* of the word and should not be looked on as having only a metaphorical sense.

In the 13th century, a Franciscan, Peter John *Olieu*, held that the same reality could not simultaneously be a principle of spiritual operation (thought) and a principle of organic operation (sensation, nutrition). It was necessary, therefore, to distinguish three principles in the soul: one rational, which is free of all corporeal contamination; another which is sensitive; and a third which is vegetative. The last two were in themselves

¹⁴⁵ *Summa Contra Gentiles*, I. II. ch. 87: "Anima— humana hoc habet proprium, inter alias iormas, quod est in suo esse subsistens, et esse quod est sibi proprium corpori communicat." See *Summa Theol.*, I-II, q. 4. a. 5, ad 2.

the form of the body; but the first, the rational soul, was not truly the form of the body. It was a form related to the sensitive and vegetative principles, and, strictly speaking, the form of man but not of the body. After his death, the Council of Vienna (1312) condemned as heretical the denial of the truly formal role exercised by the rational soul in relation to the body ¹⁰

The reasoning of Olieu forgets that the soul is not the proximate principle of operations, but their first principle. He, furthermore, did not recognize the existence of distinct operative powers. Nevertheless, the solution of his difficulty is there. All the powers are undoubtedly derived from the soul, but certain ones require extension for their exercise. These powers, then, obviously are not derived from the soul alone, but also from the matter which it animates. There are other spiritual powers, which are derived from the soul alone. Thus the same soul can be the form of the body and still of itself exercise intellectual operations.

2. The rational soul is *the only* substantial *form* in each individual man. The substantial unity of man demands this.

Actually, no substance can admit of more than one substantial form. Substantial form, together with prime matter, constitutes an essence capable of existing by itself, a complete substance. Every determination which is added to an already

"* " Quisquis deinceps asserere, defendere seu tenere pertinaciter praesumpserit quod anima rationalis seu intellectiva non sit forma corporis humani per se et essentialiter, tamquam haereticus sit censendus " (Decree of the 6th of May, 1312).

¹⁰* The following translated quotation is found originally in *Dictionnaire de Théologie Catholique*, art. Olieu, col. 985. " Scotus was inspired by Olieu's theory on matter, as act in itself and separable from form. " Whatever it was in the thought of Olieu, for Scotus " the powers of the soul are neither distinct among themselves nor distinct from its essence, " as Gilson writes in *Jean Duns Scot*, p. 502. However, " there is always unity of actual existence and a plurality of formal beings in any given substance " (*ibid.*, p. 507). " This principle allows us to understand that the soul contains unitively, i.e., in the real unity of a single being, powers which are formally distinct as are intellect and will " (*ibid.*, p. 508). See also E. Bettioni, *Duns Scotus*, Eng. trans. Bernardine Bonansea (Washington, D. C. : Catholic U. of Am. Pr., 1957) pp. 76-81.

constituted and existing substance can be related to that substance only as an accidental form. *

This general argument takes on a particular force when it is applied to man. Outside of man, we often hesitate about the limits of substances. With him there can be no doubt. Man has an internal experience of a nature which is truly one, an existence which is completely personal. Now, it is the form which is the reason of substantial unity. Multiple forms indicate the multiplication of different reasons for unity and constitute as many substantial unities as there are forms.

The partisans of the doctrine of plurality of forms (St. Bonaventure, Scotus and Father Descoqs, S.J.) must logically also uphold a plurality of souls. Their '*principal mistake*' is to place forms at the level of experience, to make things of them, whereas they are principles of things. We can concede that experience shows us a mounting complexity in physiochemical actions and vital operations, but they place a substantial form behind each type of manifestation. By that they leave themselves open to a second criticism : they seem to make abstractions real. Though we speak through abstractions about the physiochemical phenomena of man, in much the same way as we speak of them in plant and mineral, nevertheless the reality of these phenomena in man is not for example some reality distinct from sensation. Chemical

"*Summa Theol.*, I^a pars, q. 76, a. 4 : " Forma substantialis in hoc a forma accidentali differt, quod forma accidentalis non dat esse simpliciter, sed esse *tale*.... Forma autem substantialis dat esse simpliciter.... Si igitur ita esset, quod praeter animam intellectivam praexisteret quaecumque alia forma substantialis in materia, per quam subjectum animae esset ens actu, sequeretur quod anima non daret esse simpliciter et per consequens, quod non esset forma substantialis.... Unde dicendum est quod nulla alia forma substantialis est in homine, nisi sola anima intellectiva, et quod ipsa, sicut virtute continet animam sensitivam et nutritivam, ita virtute continet omnes inferiores formas (the forms of elements and compounds, contained in the nutritive soul); et facit ipsa sola quidquid imperfectiores formae in aliis faciunt. "

Here we have a formula, which is more precise, even if the doctrine is not : *Summa Theol.*, I^a pars. q. 76, a. 6, ad 1. " Una enim et eadem forma est per essentiam, per quam homo est ens actu, et per quam est corpus, et per quam est vivum. et per quam est animal, et per quam est homo. "

combinations and sensations are man. But there is a strong temptation to cut up things according to the pattern of ideas, which we abstract from them and apply to them. The partisans of a plurality of forms seem to have yielded to this temptation. Their multiple forms are not the real substantial forms which constitute things. They are the distinct forms by which our thought conceives each real unity and through which it is compelled to express the intimate riches of this unity of being.

3. *The individuality* of the soul is assured by its role of form. This is not directly challenged today. However, the idealism of Brunschvicg seems *very* much to lead in the direction of a challenge. To what extent does it admit, and, above all, how does it make a distinction possible between individual and universal mind? It is difficult to understand it. Sociologism likewise compromises the individuality of the soul by making individual thoughts participations in collective consciousness.

The most obvious and specific protestation against the individuality of the soul is found in Averroes, an Aristotelian of the 12th century, whose major preoccupation is guaranteeing the spirituality of the soul. Only one agent intellect can exist, one *spiritual* soul for all men of all times, because only *corporeal* forms can be multiplied in the same species and be distinguished in an individual way.

Averroes is not completely mistaken. The principle which he invokes is true, since the multiplication of a form supposes its limitation, and therefore its incorporation. St. Thomas will broaden this line of reasoning and use it to explain the plurality of beings and the infinity of pure act : " Actus non limitatur nisi per potentiam. " Only by virtue of this principle can we prevail

"* Nevertheless, this seems to be what Scotus wishes to say when he makes a formal distinction between the souls or forms in man, but denies any real or actual distinction between them. " We must guard ourselves against two opposite errors, one which denies that Duns Scotus taught the plurality of forms, and the other which understands this plurality as one of actual distinct existences in the heart of the composite. " E. Gilson, *Jean Duns Scot* (Paris : Vrin, 1952), p. 475, note 3; see also pp. 492-497.

against Averroes, since, despite him, the rational soul is truly substantial form.

Actually, in its union with prime matter, the soul finds a principle which limits the specific perfection of which it is the source. The incorporation of a form places a limitation on it, not only by restricting it to a determined spatio-temporal dimension, but also by restricting it in its spiritual functions, since the origin and, to a certain extent, the development of its ideas and will acts are associated with images and material things. By reason of the "incarnation" of the soul, we can speak of the similarity and the opposition between souls, which are conditioned by physical heredity, education, social or geographical environment, or historical moment. However, in order to be precise, we must restrain the individuating role of matter to that single moment *wherein the soul acquires its substantial individuality*, i.e., to the moment at which it begins to exist in union with the body (see the origin of man, which follows). Once this individuality is acquired, it can not be lost, at least as long as the soul exists.

Whether we explain it or not, the individuality of the soul is a fact. The constitutive principle of the individual, the root of the personality of man, the soul is necessarily individual in each man. 147

>« We must guard against interpreting the individuation of the soul as being due exclusively to its reception into matter. Is the human soul really and completely measured by its role of form? Certainly not, since it is spiritual and subsistent in itself. We have already seen St. Thomas correcting Aristotle with an Augustinian idea, which is also Platonic and Christian, when he treats of the soul's knowledge of itself or its intellectual activity. We will see him work in the same way in regard to the creation of the soul, its immortality, and the quasi-angelic functioning of the separated soul. The case of the individuation of the human soul is reserved for special delineation.

* Nulla forma, in quantum hujus modi, est haec ex soipsa. Dico autem 'in quantum hujus modi' propter animam rationalem quae quodammodo ex scipsa est hoc aliquid, sed non in quantum forma." (*De Trinitate*, q. 4, a. 2.)

Can we not, actually, make a distinction between individual human souls because of their proper and personal destiny, which, being everlasting, is authentic being and distinct from every other by its own degree of participation in the Divine Being?

4. *The simplicity* of the soul is also implied by reason of its nature as form.

If we make the soul, as Descartes did, a complete substance, we can still ask ourselves whether this soul is simple or a composite. However, if we call the soul a substantial form, it is equivalent to saying that it is :

a. *simple in its essence* (simplex essentialiter) : a corporeal substance, the body, is a being which is composed in its essence. The soul, being form, i.e., a first principle of a composite, cannot itself be composed.

b. *also simple by reason of its opposition to extension* (simplex integraliter), or not demanding integral parts, which are external one to another. Actually extension is not substance, it is only an attribute derived from substance. Thus, the constitutive parts of a substance, and especially the form, cannot be composed of parts which are external one to another.

Moreover, the soul is simple, this time in opposition to prime matter, in the role it plays relative to extension. Prime matter is the principle of extension, the root of its indefinite multiplicity, the source of spatial composition. The substantial form, on the contrary, is the first principle of all the determinations of extension, the source of its specific unity and of its undividedness.

Nevertheless, the simplicity of the soul *is not absolute*. From the point of view of powers, the human soul is the most complex of all forms. Its operations and its movements clearly show that its simplicity is not that of an element, nor of an abstract unity, but the extraordinarily rich simplicity of a principle, of a being, of a life.

Simple in its essence and its completeness, the soul is multiple in its powers.

5. Finally, *the presence of the soul in the body* is made intelligible.

According to Descartes, the privileged point for the dwelling of the soul in the body is the pineal gland. When he states,

"The soul is truly joined to the entire body," the above assertion becomes even more mysterious, since his doctrine on the pure spirituality of the soul will not permit any union between it and the complete materiality of extension.

If, on the contrary, we see the soul-form constituting a complete being only by reason of its union with matter, then the soul is *everywhere* its matter is and *only there*.¹⁴⁸

It is in each part of the body *in its essential totality*, since it is simple in its essence.

However, it is not present in each of the parts of the composite *in its potential totality*. Actually, it exercises its *vegetative* and *sensible* powers in differentiated organisms, which are distinct from one another, so that one power is in this organ, and another in that assemblage of organs. As for the *intellectual* powers, it exercises them without any essential dependence on the body, but not without a special link with the organs of sensation and imagination, since these functions serve it in abstraction : thus we can say that it is especially present in the brain.

The possibility of a consciousness of a physical ego having an exteriority and inferiority relative to the proper surface of a body is based on this omnipresence of the soul in the body. The soul-form thus unites the ego and the non-ego, idea and sensation, spirit and matter, without mixing them up. It allows them to be differentiated without leading ultimately to the rejection of one for the sake of the other. It excludes *idealism* which safeguards only the first term of the above pairs,, and it also excludes *materialism* which respects only the second of the above pairs. In a word, the soul-form expresses and sums up without any clash the different data of psychological consciousness. It guarantees their truth by uniting them.

"• At least inasmuch as it is form. Inasmuch as it is spiritual, it could be present elsewhere than in its body without any contradiction being involved. It would have to be there in a spiritual way, not in a local or quantitative way. It could be present elsewhere by thought or by love. Could it be there in a substantial way? With a directly acting presence? These are problems which the lives of the saints might clarify perhaps....

Thus the testimony of consciousness on human substance need not be rejected as blighted by an internal contradiction. Man is *thinkable* as a substantial unity. The experience of the "I" is, therefore, only the pure and simple expression of its reality. *I am truly such as I appear to myself.*

But here again trouble confronts me, if I turn my attention from my substantial structure to my temporal function, to my becoming as such, to my fugitive and successive mode of being, if I attempt to grasp the scope of my life before the first moment of my conscious life, or beyond the present moment, or beyond every moment, in a mysterious but foreseeable term which is death. Whence *have I* come into existence? Where is *my destiny* drawing me?

BOOK TWO

THE ORIGIN OF MAN:
GOD AS CREATOR
AND PROVIDENCE

Fifth Question : *What is the cause of man.*³

- Fifth Thesis:
1. Man *begins*, lives and dies, by the *action of natural causes*, but ultimately by the *free election of a Provident and Creating God*.
 2. However, the human soul has an *immediate Creative Cause*.
 3. Therefore, the *origin of the human species cannot* be explained by a completely *mechanical evolution*.

A. The problem here is twofold.

1. *The human individual* begins to exist. *Ordinary experience* is sufficient to testify to that. Birth is the proof of it. Another proof can be found in the fact that psychological life has a beginning and that memory goes back in the person only to a certain moment, which is considerably after the time of birth, although the individual begins before birth. *Science* furnishes us with some precisions on this subject. The individual begins at the moment the egg is formed as a result of the fusion of a spermatozoon with an ovule.

2. *The human species* also began to exist. This is the *empirical* data of very many, if not all religions. It is also a *scientific* certitude. The most fundamental reason is drawn from cosmogony. The earth was at first a planet in formation, where all organic life was impossible. It has been estimated that the first living creatures made their appearance on our planet some 500,000 million years ago in the Pre-Cambrian period.

To pin-point the epoch at which the human species began is impossible. We can speak of humans only from the period in which they began to leave traces of their existence. These traces are of two kinds : (1) *fossils*, which are whole or fragmentary

skeletal remains, dated by their relative positions in the geological layers of the earth; (2) *utensils*, traces of *fire*, products of *art* or *industry*, *burial places*, in a word, any object that would suppose *intellectual activity*.

The oldest fossils, which are certainly human, date from the beginning of the quaternary period, between the third and fourth glacial invasions of the earth. The age of the human species could be around 500,000 years. The principal human fossils are made up of two races, that of the Neanderthal and that of the Cro-Magnon.¹

The Neanderthal man has an elongated skull with a receding forehead, very pronounced brow ridges, a very large nose, strong and prominent jaws which are in contrast to a weak chin. *The Cro-Magnon man* has the same elongated skull, but has a high forehead, his brow ridges are not very pronounced, the nose is small, and the chin prominent. He differs little from the contemporary European, whereas the Neanderthal type can scarcely be found, except among certain Australian tribes.

The mark of the human on these remains is in the objects of civilization which accompany them. The two types of which we have been speaking belong to the Old Stone Age or the *paleolithic* period. The characteristic utensils are made of *chipped flint*. The differing forms and the degrees of perfection in the chipping have led to distinguishing six periods which embrace three periods in the history of the Neanderthal, and three periods in that of the Cro-Magnon. From the beginning the skeletons testify to the fact that the bodies were buried (as at La-Chapelle-aux-Saints), which is proof of thought and even of belief in a hereafter. The arts (sculpture and afterwards painting) are very well represented among the Cro-Magnons, and they seem to have been employed for magical or even religious purposes.

The *neolithic* period or *polished stone* age witnesses the sedentary life of farmers succeeding the nomadic life of hunters. It is the time of pile-dwellings, the domestication of some kinds of animals, and the cultivation of edible plants. It is the epoch

¹ See William H o w e l l s, *Mankind in the Making* (Garden City, N. Y. : Doubleday, 1959). PP- 189-213.

of the megaliths, whether religious (menhirs) or funereal (dolmens).

After this there is the *bronze age*, then the *iron age*, and finally history which replaces prehistory.

But other fossils, which are at least allied to man, dating from the lower paleolithic period, have been discovered, mostly in three regions :³

a. In the *Far East* : the Pithecanthropus was uncovered in Java (1891 and 1936-1939), and the Java man (in 1931) at Ngandong on the Solo; at Chou-Kou-Tien, near Peking, the Sinanthropus. Their respective cranial capacities were found to be : 900 cm.³ (Pith.), 1100 cm.³ (Sin.), 1200 cm.³ (Jav.).

b. In *Africa* : A type very much resembling Pithecanthropus was discovered in Oran. In Rhodesia, the Africanthropus, a type similar to the Sinanthropus, was unearthed. Near the Cape of Good Hope, at Saldanha, a type more or less resembling the Neanderthal was brought to light and judged akin to the Java man.

c. In *Europe* and the *Levant*, various fossils have been discovered. Near Heidelberg, the mandible of a man was found, which is now referred to as the Heidelberg Man (or the man of Mauer). Other finds have been made near Rome, at Saccopastore; in Palestine (Mt. Carmel and Nazareth); in England, at Swanscombe; in France, at Fontéchevade (Charente).

The man of Mauer seems to be an intermediary type between Sinanthropus and the Neanderthal man. The others, which are of a more recent origin, resemble both the Neanderthal and Cro-Magnon types at the same time. A jaw bone of the same mixed type, taken from the caves explored recently at Arcy-sur-Curc (Yonne)³ reinforces the hypothesis of a co-existence of the two races and perhaps even a chronological priority of the Cro-Magnons over the Neanderthals.

* *Ibid.*, pp. 151-186: pp. 215-223: see also M. Grison, *Problèmes d'Origine*, p. 187; see pp. 183-237, for the actual data of science.

³ *Ibid.*, pp. 234-241 : note especially the diagram on page 236. See also *Science et Avenir*. Nr. 100, pp. 244-249.

The best available chronology seems to place the fossils we have just mentioned in the early paleolithic period. The Neanderthals belong to the middle paleolithic period: they have been found scattered throughout Europe; while the races of the Grimaldi, Cro-Magnon and the Chancelade belong to the late paleolithic period. The earliest seem to be negroid and related to the present Hottentots. The Neanderthal seems to be Asiatic in origin, while the last three are properly European.

If the Neanderthal race and the three races which follow them are considered as humans by reason of their utensils, their burials, or even their artistic designs, the same is not true of the evaluation made of the fossils which date from the early paleolithic period. Men certainly existed at this date, but we are not always sure that the chipped flints and the traces of fire originated with the beings whose remains make up these fossils. Thus, the truly human character of the *Sinanthropus* remains debatable, despite the fact that it was discovered in a cave filled with a mass of ashes measuring seven meters in depth.

Whatever may be the case, no scientist thinks that humanity began before the end of the Tertiary period (see *Dictionnaire Apologétique de la Foi Catholique*, article "L'Homme").

Thus two problems emerge: (1) What is the origin of the *individual man*, or what is his cause? (2) What is the origin of the *species man*?

B. The individual man has as an immediate cause

1. A group of natural causes. Each human individual begins to exist at a definite moment of time, and in a determined region in space. He is a limited portion of extension, and forms a real part of the material universe. By reason of that he is subject to its general laws. Being *corporeal*, he begins to exist through the union of a substantial form with a disposed prime matter. Being a *living thing*, the essential cause of these dispositions are living creatures of the same species who are his

parents.⁴ By reason of these two facts, his existence is attached to the general causality of nature.

The generative activity of parents is not actually a pure spontaneity. It needs the collaboration of nature : nourishment, warmth, atmosphere.... It even depends on the stellar masses, if it is true that cosmic rays originate in the nebulae by way of condensation ; * because these rays seem to be a natural factor in hereditary mutation.

Thus the *natural laws* of human physiology and those of the whole universe govern man's coming into existence. These laws manifest the inner workings of natural beings. It is plainly nature which is the immediate cause of man.

2. However, nature is not the *first and sufficient* cause of man, because : a. it is the cause of his beginning in existence, of his becoming, of his duration; but it is also the cause of his death. Man, whom it constructs, it also demolishes. It has wished him to be, but now it wishes something else, and it allows him to be undone for the profit of the lower substances which will succeed him. Briefly, nature is a *moving cause, not a cause of existence*.

b. It would be impossible that nature be a cause of existence, for it does not sufficiently explain existence *since it is basically contingent* and demands an intelligent and completely free cause.

The existence of the individual man is definitely caused by the Almighty Creator of the material world, by a Thought which has conceived the plan incorporated into natures, and by a Liberty which, having chosen these natures, realizes them in the course of time. In a word, what sums up the three ideas is : Divine Providence. Through nature, it is this Divine Providence

* See *Cosmology*, Seventh Thesis.

» Do the planets exercise an influence on human generation? Do they influence men's temperament and destiny? Astrology believes that they do, and today astrologers are attempting to prove this according to scientific method (see *Les Rythmes et la Vie*, by Dr. Duprat). Whether this method be fruitful or not, planetary influence could not establish the necessity of pagan Destiny nor suppress liberty.

which is responsible for man's beginning, which conserves him in duration, and permits him to die. And if man someday finds the elixir of long life and the remedy against mortality, it will still be this Providence which frees him from death, for man can only work with the laws of nature.

However, is there not a misunderstanding of the spiritual soul of man, when we make the existence of man depend on a material nature, and look at its existence and operation much as we do that of the mineral forms and the vegetative and animal souls which are drawn from "the potency of matter?"

C. The human soul can not be drawn from the potency of matter. Every form drawn from matter, actually has an essential dependence on matter for its existence. Now the human soul is spiritual and subsistent of itself. It is, therefore, not drawn from matter.

1. Could it be, then, that the soul exists before its union with the body? *Plato* thought so, and taught that the soul was eternal. *Origen* and *Leibniz* took up this idea of preexistence in their teachings in order to safeguard the spirituality of the soul, but they attached the human soul to God the Creator. Such an hypothesis is inadmissible. As a matter of fact :

a. *The soul would exist without being able to exercise any of its operations* : because it does not find its proper object except in the sensible, and sensation is impossible without corporeal organs. But an existence which is stripped of every actual possibility of action is a contradiction. Therefore, the soul can not exist before being united to its body.

it may be objected that the same reasoning would also logically exclude the possibility of a soul's survival after being separated from the body. We must answer that it is a mistake to draw a parallel between the two cases. As a matter of fact, at death, the soul is no longer, as it was in its origin, in a state of pure potentiality in relation to its specific operations. It has acquired "intelligible impressed species," and even though separated from matter, it keeps them for its own use. Above all, it has acquired the consciousness of its existence and of its spiritual nature. There is no reason to lose this in losing its

union with the body. Although this union served in the acquiring of knowledge, we must point out that spiritual knowledge is not riveted to its mode of acquisition.⁶ The two cases are, therefore, completely opposite, since a soul surviving the union can think, whereas a preexistent soul can not.

b. This hypothesis of preexistence *misconstrues the nature of the soul*. The soul is the natural form of the body. Therefore, it is caused naturally as the form of the body, i.e., united to it.⁷

Spiritual, it certainly is, and because it is precisely that, it can not come into existence through the effect of purely material causes. Still it is also a substantial form, and that by its nature. Therefore, it must be caused in union with the body, in order to be caused according to its proper nature. As a matter of fact, all the partisans for the preexistence of the soul profess that the soul is a pure spirit, which is lodged in a body, contrary to its nature and its good.

c. This hypothesis makes unintelligible *the individual differences of souls*, which are all endowed with the *same specific perfection*. Take a particular perfection, a certain degree of heat, for example. How can it be realized in several different instances? We must necessarily appeal to a principle which is different from the perfection itself. We must appeal to the *recipients* of that perfection. Each of them, possessing it according to its proper limit, will make it individual without making it lose its specific nature. "Actus non limitatur nisi per potentiam." Thus, the substantial form is capable of being individualized only by its union with its correlative potency, prime matter. §

• See above, Second Thesis, F.

' *Summa Theol.*, I* pars, q. 90, a. 4: "Si anima unitur corpori ut iorma et est naturaliter pars humanae naturae, hoc omnino esse non potest." (Hoc, i.e., the hypothesis of preexistence).

* It behooves us to bring a nuance to this argument in the light of what was said above. The spiritual soul, as such {let us say, insofar as it has a destiny which is everlasting personal life} is individual. However, it would only have this mark of individuality, when it would take its place among pure spirits. It would not be individuated by a

d. For the same reason, *the diversification of souls by heredity* would be as accidental as that which arises from education, whereas it is very much deeper. Heredity directly modifies only the organism, but if the soul is the substantial form of that organism, it will be correctively modified with it. The hereditary transmission of psychological dispositions could not be understood if the soul were completely formed *before* its union with the body. The influence of the body on it would be purely accidental.

The essential mistake in the theory of preexistence is that it forgets that the rational soul is a substantial form.

2. Would the parents, then, be the cause of the soul, as they are of the body?

a. They could not be the cause of the soul through their transmission of the portions of organized matter which form the initial egg, because the soul can not be intrinsically dependent on matter as if it were produced by it. '

The *corporeal traducianism* of Tertullian is, therefore, inadmissible as an explanation of the origin of the human soul. This doctrine must be limited to that which is simply and exclusively organic life. If it is applied to man, it is equivalent to denying the spirituality of his soul.

b. Yet could the soul of the new man perhaps be like a spark springing from the souls of his parents, and spiritual like theirs? — The image has a poetic flare... but if we attempt to put the thought into a more scientific expression, the error becomes evident, because the souls of the parents are not extended things, which can be divided like a flame. What real role can we assign here to the parents, if we wish to translate this imagery accurately?

4 *creative power*, delegated by God, such as *Frohschammer* and *Klee* spoke of in the 19th century? No. Creative power is not delegated. To create is to produce in total independence.

relation to space and concrete time, which its nature as a form of matter demands. Its limitation would not appear to be linked, as it is now, to a "situation" in the world.

• Sec *Summa Contra Gentiles*. J. II, ch. 86.

A delegated power is always subordinate and therefore dependent.

Or shall we say, with *Rosmini*, that the parents furnish the new individual with *a soul which is simply a sensitive one, which God will make intellectual* by giving Himself to be contemplated by it under the form of the idea of being? This would be a satisfactory explanation of the role of the parents, but it admits a becoming between sensation and intellection, which certainly misconstrues their irreducibility. The same soul can not become intellectual after being completely sensitive. Either it was already intellectual at the moment when it could do no more than sense, then the parents would be the cause of an intellectual soul; or it was not capable of thinking and became so, then thinking is only a higher degree of sensing.¹⁰

Therefore, no form of *spiritual traducianism* resolves the problem. Parents can not be the productive cause of a child's soul.

3. The productive cause of the soul must be creative.¹¹ Evidently, *the soul begins*, since it does not exist before the body. *Therefore, it is caused*. Now, its existence is not completely stated as being a component of man, because, as we have seen, it is subsistent and intrinsically independent of matter in its existence, capable of transcending matter in its operation. Thus, as it is caused, it is *caused by right of substantial existence*, existence for itself. But this can not be by way of

* We can formulate a third hypothesis. First of all the parents produce a vegetative soul in the embryo, which develops into a sensitive soul; then God, when the organism is sufficiently developed, infuses an intellectual soul. This is the hypothesis of St. Thomas, but this is not the hypothesis of Rosmini. There is a succession of distinct souls, the sensitive soul disappears when the rational soul is produced in the embryo which it informs. It is not transformed into a spiritual soul.

¹¹ We ought to bring a nuance to the idea of creation, as it is used here, in order to leave a place for the role of the parents and nature. There is a creation, in the strict sense of the word, if we consider the soul abstractly in its spiritual character. The idea of creation is specified, if we see the soul as a substantial form, called into existence by the matter disposed to receive it. Actually the parents and nature must collaborate in the "creation" of a soul by virtue of that necessity which the Divine Will itself confers on the order of existent beings.

composition, as is the case with corporeal substances, because it is, in essence, *simple*. It is necessary then, that it be *caused without any part of it having preexisted* in the guise of matter, *caused all at once in its entire reality*, i.e., created.

The soul in its spiritual nature is thus the witness of God's creative act.

corollaries, a. *God*, in the production of man, can be looked at as a cause in several ways : (1) as the Free Author of nature ; (2) as particularly the Author of human nature and of the laws for the transmission of life ; (3) as the immediate and only Creator of the human soul.

b. *The parents* are causes of the child : (1) after the manner of natural causes : they *dispose* the matter for a substantial transformation which will result in a new human individual ; (2) in a specifically human way : their causal power does not extend to the production of a rational soul, as the causality of an animal extends to the soul of its young. Human causality here is in association with the creative power of God, who has so constituted human nature that the human preparation of the matter should be the sufficient and necessary condition for His creation of the soul.

scholion. at what moment does God create the soul?

1) At the very moment that it is united to the body, without any doubt.

2) But what is that moment? The moment of conception? Or is it after conception? The answers to these questions show some divergence of opinion.

a) With Aristotle, *St. Thomas* and the Scholastics of the Middle Ages, many moderns think that the human embryo begins with only a vegetative soul — that it acquires through a substantial change an animal soul, when organic differentiation is sufficient to permit sensation — and finally a last substantial change introduces a human soul, when the embryo is sufficiently organized to make it capable of specifically human operations. *

* St. Thomas expresses this opinion in *S. C. Gentiles*, l. II, ch. 89.

b) *Some modern Scholastics* (Farges, F. X. Maquart) begin the above progression at the second stage. Their reason is that the differentiation present in the egg goes in a completely different direction from that which characterizes vegetative life, and manifestly is a preparation for sensation. This reasoning is difficult to contest.¹³

c) *St. Albert the Great* and very many contemporary philosophers think that the rational soul is created at the moment of conception. The reason lies in this, that the evolution of the egg is not directed towards any animal structure whatsoever, but towards a specifically human structure, and that this evolution is potentially in the initial structure of the egg. Briefly, the egg is specifically human in its structure and in its evolutionary potential.¹⁴ This third opinion could be objected to by the others : What proof can you furnish of the presence of thought in a human embryo? The manifest proofs of thought in man are found only in his life after birth. Why not defer the creation of the rational soul until then? To these questions we can only pose the question : What proof can you furnish that the egg in its initial state does not have thought? There is no direct experience that can answer the questions of either side.

We must, therefore, attempt to reason from a general principle. However, there are a number of them and the conclusions drawn from them are not in agreement. The best approach seems to be based on the role of the rational soul as substantial form, a role which it plays by its very nature. This soul ought to exist, therefore, *from the beginning* of the undivided organic movement which is established in the evolution of the egg and the whole of individual life. Without it, how can one

¹³ See Maquart, *Elementa Philosophiae*, I, p. 542.

¹⁴ Thonnard's *Précis de Philosophie* seems rather favorable to this solution whose principle he states in the following fashion : " An anatomical structure or a characteristic functional differentiation of the human species will be sufficient to demand the presence of a spiritual soul in a human embryo. It is the job of the biological sciences to determine the precise moment at which these properties are present " (p. 846). A specifically human vital property exists, without any doubt, from the moment of the fecundation of the ovule. Could the human egg then be developed in any other direction than a typically human one?

give a basis for the unity of this organism? Instead of *one* man, we would have two or three substances, which are specifically different, only the last of which is man. Moreover, even in the second opinion (beginning with a sensitive soul), one would be admitting the possibility of an infinity of specifically different substances, since the stages of differentiation correspond to highly varied degrees in animal life, in the sense of gradually acquiring more and more complicated animal structures which are similar to biological entities that are specifically different. This opinion would admit what we object to in evolutionism, the supposition that the generation of a more perfect substance from one that is less perfect is possible.

The third position, then, would offer a solution to the question by saying that the intellective soul is created and united to matter at the moment when the spermatozoon unites with the ovule. As a matter of fact, it is precisely from that moment that cellular multiplication begins its operation, and it will not be arrested until the human organism is achieved. What difference does it make if all the human powers are not in operation from that time? Beginning with the actuation of the simplest power (multiplication, before all growth and nutrition properly so called) there will be a whole order of powers which will begin to be realized according to a properly human finality. It is a truly human soul which vivifies and directs the entire process.

D. The beginning of the species, man, could not be identical with the beginning of an individual man, as we know it. The first instance of man lacked a parent or parents of the same species. The question then arises: *Could the species man have had parents belonging to another species?* Is the human species descended from another species? If so, how must such an evolution be conceived?

1. *Biological evolution* in the limited sense of the word is an observed phenomenon. *Mutation* diversifies the specific type into sub-species, varieties and races, which are as stable as the large species. But no biologist stops there. All admit that *the families*, with their kinds and their species, have been constituted by mutation and by differentiation in the kind of

organization which characterizes their particular orders. This is *limited evolution* which is admitted by L. Vialleton, for example (*L'Origine des Êtres vivants*). Very many admit that all the species are constituted in this way from a single living thing which is as little differentiated as possible. This is *generalized evolution* held, for example, by L. Cuenot (*La Genèse des Espèces Animales*).

This generalized evolutionism involves no absurdity. The idea of "equivocal generation" is not contradictory, neither is it a demonstrated fact, nor, at the present stage of science, can it be explained by any known scientific principles. If it is to be explained at all, it must necessarily be explained by a finality,, and, from there, by a Creative and Provident Liberty.

2. But could the *human species* be genealogically derived from another purely animal species? No. For man, *by reason of his spiritual soul*, has need of a *Creator* who can produce it without using an intermediary. God, simply as the *Creator of material nature*, can not be a sufficient explanation, because of the spirituality of the soul. The soul, being spiritual and superior to corporeal nature, could not be produced by it.¹⁶

3. Could not *the body of man, at least*, have been prepared for a union with a soul by animal progenitors, as he is now by human parents? This absurd hypothesis is sometimes found amongst us. It is no more than postulating an hereditary mutation, wherein there abruptly appears a characteristic which is lacking in the progenitors. But can this hypothesis be transformed into an affirmation of fact?

no ! None of the varied scientific arguments *demonstrate*-general evolution as a fact. K When these arguments are applied

^u See above. Fifth Thesis, C, and *Dictionnaire Apologétique de la Foi Catholique*, art. "Transformisme."

^v R. Coix in, *Mesure de l'Homme*, p. 113, "(Generalized) transformism is not a fact but an interpretation of an incomplete collection of historic facts, which we can bind together by lines, of which only a few points are determined, and where we must frequently have recourse to interpolations.... In these conditions, transformism, despite its plausibility and even probability, remains, from a logical point of view, a scientific *theory* subject to more weaknesses perhaps than are involved in the theories about the inorganic world."

to the evolution of man they are even less solid. They draw their principal force from the general idea of evolution which has already been taken as a principle. However, they also draw from it their weakness, because man requires, by reason of his soul, an immediate Creative Cause, which puts his case apart from the general theory of evolution.

a. paleontology furnishes no orthogenetic series which links man to a previous species. It is possible to imagine a rudimentary and successive orthogenesis: Pithecanthropus, Sinanthropus, Africanthropus, the man of Mauer, the men of Swanscombe and Saccopastore, Neanderthals, and the races of Cro-Magnon, Grimaldi and Chancelade. Yet we can, with more of an indication, consider several of these types — which are considered progressive or intermediary morphologically — as coexisting, instead of following one another. Moreover, we have no link which ties the most ancient of these to a clearly animal type. In the majority of cases which concern fossils of the early paleolithic period, we do not even know if they are truly human. If there is an evolution in this series, that evolution could just as easily have been within the same species. The different races of dogs, for example, are more different among themselves than the more or less human fossils are among themselves. No certain orthogenesis leads from animal to man. An essential proof for evolution is lacking here. The hypothesis has not been proven false, but it still remains pure hypothesis.

b. the ontogenesis of man is no better proof of his descent from the animal kingdom. The similarity between the stages of the human embryo and certain animal structures can be very well explained without any such heredity. These stages are only rough shapes, which do not resemble the structures of adult animals, but only their embryonic shapes. There need be no more to this similarity than acknowledging that the development goes through similar stages in species, whose adult structures present a certain generic resemblance.

c. comparative anatomy stresses some one hundred rudimentary organs found in man. They are, according to the men of this science, the atrophied remains of once useful organs,

which testify to an animal ancestry which once exercised them. There seems to be a slight supposition lurking behind this particular reasoning. It would seem to take for granted that it is easier to know every possible utility of an organ than to admit that our science might be more rudimentary than the aforesaid organs. Such a line of reasoning seems to suppose that an organ, which is useless in an adult, is also useless in an embryo. Now, embryology tells us that this is not always true. It also seems to suppose that every rudimentary organ in present day man has not always been rudimentary in the human species.

Is it not possible that the motor muscle controlling the auricle of the ear was functionless even in the Neanderthal man? An *evolution within the species appears sufficient* to explain organs which are certainly rudimentary.

The *alleged animal origin* of the human body is, therefore, not a certain fact. It has a certain likelihood which arises from man's late appearance in the series of mammals, and from the existence of structures quite similar to his own, especially those of the anthropoid monkeys, the gorilla, the orangoutang and chimpanzee.¹⁷ That likelihood, however, is sometimes not a little subjective. What happens to this type of reasoning, when one is confronted with the many profound and objective differences which separate human organisms from simian ones? ¹⁸

1) *As to structure*: the gorilla's *brain* weighs from 400-500 grams, with a volume of 530 cm.³; that of a man weighs 1360 grams, varying in volume from 1300 cm.³ (Negro) to 1550 cm.³ (European), or even 1600 cm.³ in the Neanderthal man. These differences involve a striking superiority of sensory powers in man, when compared to monkeys. This is especially so, if we take into consideration the surface of the cerebral cortex, as it is augmented in man by folds and circumvolutions (see R. Collin, *Mesure de l'homme*, p. 170), and the relation of cephalization which is expressed between the weight of the brain and the total weight of the body. This index is 2.73 for man,

¹⁷ W. Howells, *Mankind in the Making*, pp. 74-87.

¹⁸ *Ibid.*, pp. 87-95. O'Toole, *The Case Against Evolution*, pp. 269-307.

whereas it attains only around 0.7 for the anthropoids (see M. G r i s o n , *Problèmes d'Orig.*, p. 178).

The human *skeleton* as a whole is quite different from that of a monkey. It is a *vertical* skeleton; the head rests at the top of the vertebral column. The curves of the latter are adapted to vertical posture. The thorax is flattened from front to back and not from left to right. This particular disposition dominates the structures of waists and the disposition of members which are attached to the trunk. " In monkeys these dispositions are completely contrary to man's.

2) *The biological functioning* of man would have a hard time doing without the *-power of invention*, which is reason. His organism is deprived of those natural defenses which are most essential to an animal with a constant temperature, viz., hair or feathers. It seems that he can maintain himself only through thought which creates clothes and dwelling, and makes use of fire.

3) Finally, *the development of man* is very specific. The anthropomorph lead an independent life and can reproduce in from three to eight years. They are completely adult at ten years. Man reaches puberty only between twelve and sixteen years, and is scarcely adult in twenty years (the cells in the nervous system are not adult until around thirty years). From this, important consequences follow : the necessity of a *stable family*, the possibility of a *social education*, the possibility of acquiring a *great number of images*. ** To argue by an appeal to a mutation in those regulators of growth, the endocrine glands, will certainly point up a difference between man and his immediate ancestor, but it does not explain it. It is inconceivable that man is only an enlarged monkey, retarded in its growth. He is *another type of living thing*.

The passage from a supposed ancestor to man could not, in any case, have been accomplished by a slow and continuous variation. There would have had to be a complete break-off from the primitive type, a " mutation, " if you wish, to indicate

** *Ibid.*, p. 76.

20 See L. Guén ot , *La Genèse des Espèces Animales*, p. 548.

that the limits of the former species had been completely passed. Yet it would have had to be a vastly complex and profound mutation, and not one of those experimental mutations which change colors, or produce spots, or remove the wing of a fruit fly, or double the size of petunia leaves.

The hypothesis of the animal origin of the body of man is only a hypothesis, alluring for the scientific imagination, but quite gratuitous according to the standards of pure reason.

4. *Within the context of this hypothesis*, how can we arrive at the possibility of a sufficient cause for such an evolution?

a. There is no answer in a *complete mechanism of efficient causes*. For :

1) *The bare notion of efficient causality* always leaves us without an explanation of the direction it impresses on its results. From the time we suppose a mechanism of efficient causes, i.e., a cascade of causes and effects in a determined order, we are supposing a direction, a final destination in causes. Consequently, pure mechanism in nature is an impossibility. We would have a determined order of causes stripped of that which would determine them from within, stripped of that which would direct them. Thus, all natural determinism is a mechanism which demands finality.¹¹

2) Therefore, "a fortiori," *biological evolution* demands a finality, because it constructs organs and types of organization, i.e., it creates finality. It shows in its work a spontaneity which is determined in a contingent and yet directed way. Orthogenesis is unthinkable without a "preordination" (Cuénot).

3) *The applying of the evolutionary theory to man* would be only biological finality in its highest degree of clarity. It would be folly to make human thought the fortuitous consequence of the immense work of differentiation, which, through the vast geological ages, would have constructed the human brain and with it the particular organism correlative to such a brain. We would have to suppose that thought is only a transformation of

¹¹ See *Cosmology*, Tenth Thesis, D.

mechanical energies, and with that admit all the confusions of empiricism and materialism. One would have to say that the "fortuitous" has been reproduced by heredity since the origin of life. To place a thought in a brain, which has been differentiated up to the point that it can use it, and explain it by a cause which is purely mechanical is as worthless as would be a gram of powder to blow up New York from the moon without cannon or shell. —

b. *The only sufficient cause of such an evolution must be God, the free Author of Nature and the Creator of the human soul.*

His role as Creator is no less necessary at the beginning of a species, than it is at the beginning of each individual of the species, for the soul of the first man was spiritual and subsistent.

His role as Author of Nature is that of a Providence which realizes His freely chosen plan. This Providence concerns itself evidently with all the details of the plan as well as with the plan as a whole, i.e., *it specializes* according to what each of these species contains, and it brings it to its place in existence. If each biological species introduced into the world by way of evolution is already the effect of a *special action* of Divine Providence, how much more reason is there for this being true about the human species. Why? Because a productive action ought to correspond to the dignity of its effect. Now the human species is the most elevated of all corporeal species, because of the spiritual functions which belong to it exclusively. The last step of the evolution, which, in the hypothesis being considered, constructed the first human body and harmonized it with an incarnate rational soul, must have as a cause, not only natural, biological and cosmic causalities, but a *very special influence* of Free Divine Providence.

Was it only a *finalizing motion* directing previously existing natural causes and making them develop into a specifically human type? Was it a *productive action* coming as a new act of the Creator? Only God can tell us.

But He has not done so. The theology of revelation admits that God did not create the body of Adam piece by piece, but that He transformed preexisting matter, "the slime of the

earth," and gave to it a spiritual soul. It says nothing about the manner of this transformation, nor of the nature of this very special intervention of Divine Providence.

The mystery of the origin of human organism, therefore, remains a mystery. One single point is certain for both the philosopher and the believer : God has willed this organism and has realized it. The rest is hypothesis. Has there been an evolution? Perhaps. Was it purely mechanical? Assuredly not.

BOOK THREE

THE DESTINY OF MAN

Beatitude, Immortality, Resurrection.

Sixth Question : *What is the final end of man?*

- Sixth Thesis :
1. The final natural end of *man* is the *personal possession of all natural truth*, i.e., the loving knowledge of a *God who creates and rides* man and nature. This constitutes at the same time the glory of God and the beatitude of man.
 2. Therefore, *the human soul* is,
(a) by its *nature, immortal*; (b) and it will “*de facto*” *never cease to be*.
 3. The human soul by a natural right demands the *resurrection of its body*.

A. This problem is the most tragic and the most personal of all the problems of philosophy. We have been launched on the sea of life. Where is the port? Without this problem there wouldn't be any others. All of the *practical problems* of philosophy are only aspects of this one : What direction ought I give to my life? All *theoretical problems* are born of this essential one : Where is my life going? It was by reducing the answer to a theoretical and practical “*know thyself*,” that Socrates saved philosophy from the complete dilettantism of the Sophists for whom there were no longer any problems.

Empirical knowledge gives as many answers to this question as there are conceptions of human life. From those “*whose god is their belly*,” to those who wish to love God for Himself, all men in whom some moral conscience has been quickened, attempt some sort of answer to the question. *The moral philosophies* have taken stock of nearly all of these answers. *My life is where my Good is*. Everyone agrees with this. Besides, this is no more than the recognition that man has a will whose object, in general, is human good, a will which can direct man's whole life in aspirations which correspond with or go beyond all or any of his particular tendencies.

but what is this good? Needless to say, there are many differing answers to this question. Will it be worthwhile to enumerate the goods which, for one reason or another, can solicit the activity and desire of man? I think not, for in this case an appeal to our own personal experience ought to suffice. Yet, it is precisely this personal experience which makes a man irresolute, hesitant, before the diversity of these goods and before the conflict of desires which arise in their presence. Personal experience drives us to reflection on the direction which we will give our life, so that we can give it a direction which is more than apparently true, for we seek certitude in these decisions. Therefore, it is a question of finding the Good which is truly and certainly the Sovereign Good for man, even if it does not appear directly as such. ¹

*From the point of view of psychological awareness, the Sovereign Good is identical with complete happiness or "beatitude." Joy is simply the feeling which results from a satisfied tendency. Where joy is perfect, all tendencies have been satisfied, all the goods possible for a subject are possessed. Thus, beatitude is not possible except in the possession of the Sovereign Good. But from this single point of view, the problem posed is insoluble. It can be resolved only by an experience of complete happiness, which would then be the indication of the presence of a Sovereign Good.*¹ Nevertheless, experience allows

* See E. Gilson, *St. Thomas d'Aquin*, pp. 32-64; *Summa Theol.*, I-II®, q. I, 2 and 3; *S.C.G.*, I. III, ch. 25 to 64.

* Such an experience is not possible in this mortal life. See *S.C.G.*, I. III, ch. 48. Granted that there is happiness in this life, but it passes as quickly as a lightning-flash in the night sky. It is something which is always precariously held, something always threatened. Yet complete happiness. "Status omnium bonorum congregatione perfectus" (Boethius), demands assured duration and secure possession. Human joy is always a mixed affair; the slightest inattention is sufficient to diminish it, passion clouds it over, error upon which it is sometimes based makes it illusory, yet happiness demands that these things be no part of it. A child may be happy but he doesn't realize it. The adult never finishes learning and his appetite grows in the measure that he satisfies it. This is not all: the simple awareness of death makes man incapable of joy, and death's very presence suppresses man himself. In short, man, on this earth, is always perfectible but never perfect. In his knowledge, in his moral life, in his social life, there is always something wanting. How could

us to draw a conclusion, but only a negative one. It shows us that no happiness achieved in the succession and instability of *time*, or in the limitation of *space* is capable of completely satisfying man. Those who have placed their beatitude in temporal goods, riches, honor, fame, power, health, bodily advantage, or pleasure, have recognized at some time or another that they have mistaken the shadow for the prize. This illusion furnishes the poetic drama of Ecclesiastes, which draws from this universal experience the occasion to exhort creatures to turn to their Creator. ³

From an ontological point of view, the Sovereign Good is a Good capable of fulfilling all the aspirations of human *nature*, capable of terminating its restless movement, by making it "perfect." In an objective sense it is the *final end*, the end which gives to all other ends their power of attraction, the end beyond which there is nothing more to be desired, and in relation to which all other ends are called good or bad. Thus, for him who places his end in pleasure, all effort becomes detestable; for him who places his end in duty, effort is a means, and, because of that, it is good. This ontological point of view will permit us to proceed with a positive solution. Let us examine the nature of man and his specifically human direction. The terminus of this specific direction is necessarily the ultimate end of nature. It is not that which the individual "de facto" pursues, but that which nature pursues in him, despite the obscurities of his thought and the deviations of his liberty : * it is his natural Final End.

he be fully happy, unless by being completely ignorant or by a complete disregard of morality, and what could this be but supreme misery?

• See *Summa Theol.*, I-II», q. 2; *S.C.G.*, I. III, ch. 27.

• Man's nature is capable of being realized naturally only in part. It is achieved only by reason of free will. This choice is not free in every sense. It is subject to the direction of nature which is formulated in the moral law, which limits choice in relation to reason and shows certain actions to be obligatory', even though they can not be forced. In this sense man gives himself his nature, "he becomes that which he is." In this sense also, he can destroy his nature and ruin his existence. The delicate task, here, is to separate, at the source of the things willed, such as they are, complex, divergent, and even contradictory', the will willing, whose power they use, the natural impulse towards man's Final End.

One could ask here : *Must we admit a Final End?* Ought not psychological movement be pursued indefinitely without ever reaching a final state of achievement?

These questions suppose that the very idea of a Final End demands the suppression of change, and thus the end of change is the cessation of change. This supposition is only partially true. The possession of the Final End makes all *seeking or searching* movement impossible, but certainly not the movement of *enjoyment*. On the contrary', the Final End alone places psychological life in the state of its fullest exercise, in the state of perfection.

Now, wherever change occurs, there must be, by a rational necessity, a Final End. As we know, every change tends towards at least a relative end, towards a state of determination which will soon belong to it. But there can be no relative end, unless it is *directed towards another*, unless it is an *intermediary* for attaining this other, and is *finalized* by this other. If there is no end which is completely and totally end, no intermediary end is possible, since there is no sufficient reason for intermediary finality. Every change, then, must be directed definitively towards and by a final end. Thus, the Final End is that which finalizes means and intermediary ends, an end which is neither actually nor potentially finalized by any other. In movement, it plays the role of a *first* principle in demonstration, of a *first* cause in productive action, and it is the sufficient reason for all the stages of movement. *

Our problem, then, has this metaphysical sense : What is the direction in the changes of an existing human nature? In what does the sufficient reason of its movement consist? What is its Final End?

• *Summa Theol.*, I-II", I, q. 4. " In omnibus enim quae per se habent ordinem ad invicem, oportet quod, remoto primo, removeantur ea «piae sunt ad primum.... Id... quod est primum in ordine intentionis est quasi principium movens appetitum ; unde, subtracto principio, appetitus a nullo moveretur... ; principium autem intentionis est ultimus finis.... Si non esset ultimus finis, nihil appeteretur, nec aliqua actio terminaretur, nec etiam quiesceret intentio agentis. "

B. The final end of man § is the personal possession of a specifically human Good.

The manner of tending towards and of satisfying a tendency, the manner of seeking and possessing, the manner of moving and resting, must reveal to us one and the same being. We must, therefore, find, in the way in which man desires, the indication of the way in which he will be fulfilled.

Now man has a way of tending, of seeking, of moving himself, which is specifically *personal*.

It is, then, in a *personal* way, that he will satisfy his tendency, possess his good, and rest in that possession.

In what does this personality consist in human life? Is it the simple incommunicability which belongs to every substance, or the immanence which characterizes the living substance? No, it is the incommunicability of rational *thought* and free *will* and of the consciousness which conditions it. By *knowing* what he desires and lacks, man seeks to possess his good through his intelligence and will in an intimate, inalienable and conscious possession; when he possesses it, he will then know it and will enjoy it. This consciously realized possession of the good is the Final End of man. Thus the possession of the Sovereign Good is *personal* in each man. It is realized *because of intellectual operation* and by means of free will.

Is it possible that man could possess his Good without knowing it, and so continue to seek it? Would such a one be in the state of a Final Good, of human perfection? Supposing that a man knows the Good which he possesses, but he is

- The question of Final End can be presented in two senses :
 - 1) an objective sense. What is *the Good* which, possessed by a being, endows it with its supreme perfection?
 - 2) a subjective sense. What is the *act of possession* which brings to a being its supreme good?

In the first sense, God is the supreme end of all that exists. If we presuppose that the problem in regard to the first sense is settled, we will have very evident reasons for excluding from the role of man's final end all temporal values, and all the goods eliminated by St. Thomas in *S.C.G.*, I. III, ch. 27 to 36. However, there would still remain the question of how God is man's last end, and we arrive at the second sense of the question. In psychology, we ought to begin with man. and, therefore, with this second sense.

indifferent to it, or even rejects it with hatred, could this man be said to be in a state of beatitude? This Good which is in him, can it truly be *his* Good, *his* End?

The Final End of a free being must be possessed through a conscious knowledge and a consenting will, in a vision inspired by love.

1. *ÍArtí kind of knowledge is this?* (1) It can not have as its aim the directing of action, as if action still had some usefulness, since all its possible aims are attained in the Final End. It is, therefore, *not* practical knowledge, but contemplation. (2) However, this is *not* an *abstract* or objective consideration, because every abstract notion is incomplete and must be completed in a movement of research, discourse or judgment. Now all research ceases when the Final End is attained.⁹ Nor is this knowledge merely a subjective consideration, for man in possession of his End knows that it is found there, and this awareness of an intimately present Good is a most concrete knowledge, in fact the most singular that can exist. To be this concrete, it is necessary that the *contemplation* in which man finds his ultimate end should be *linked to*

I S.C.G., I. III. ch. 25: "Omnes... scientiae et artes et potentiae practicae sunt tantum propter aliud diligibiles; nam in eis finis non est scire sed operari"; ch. 30: "Operationum artis fines sunt artificia; quae non possunt esse ultimus finis humanae vitae: omnia enim propter hominis usum fiunt. Non potest igitur in operatione artis esse ultima felicitas." Here we have techniques, production, the arts put in their place. They are means whose end is man.

See Blondel, *La Pensée*, II, pp. 171-186, on the human function of art: "Its very life and grandeur is to accompany man. and be, at the same time, a diversion, a support, a joy, a sorrow, a viaticum, in man's ascent towards those realities which cannot be completely contained within or possessed by any human masterpiece, but which, nevertheless, need the vehicle of art to penetrate the human soul.... The works of art are, therefore, instruments of culture, knowledge, stimulation and anticipation." (pp. 184-185).

• The possession of the end through knowledge cannot be any type of present knowledge, since all present knowledge is basically and necessarily abstract. Is not the universal the proper object of our human knowledge? Neither the reflection on eternal principles, nor an empirical knowledge of God, nor a science of God obtained through demonstration can be sufficient to constitute our possession of beatitude. (*S.C.G., HI, 37-39*).

action, because it is the contemplation of a good, and the good is defined by its relation to desire, to action. This is especially true of the contemplation of a "personal good," whose presence can enter the awareness of humans only by their acts, especially by their *free and moral action*. Therefore, this "contemplation — end" of human nature is not the cold reflection of a reality which is outside of man. It is the perception of the good as it has been obtained at the end of an action. To use the expression of Hamelin, • it is "*the appreciation by the subject himself and from the subject's point of view of a state, in which the satisfaction of a tendency has placed him,*" and we might add here, *of all his tendencies* or of his nature. It is a contemplation which begets love in all its plenitude, a beatifying contemplation which is primarily merited, a knowledge converted entirely into love, a joy in knowing, the "*Gaudium de Veritate*" of St. Augustine.

2. But what is *the specifically human good* or object of this beatifying contemplation? The answer is contained in the idea of human nature, explained above.

Man is one nature. His tendencies are not simply multiple and diverse. They form a natural hierarchy of powers which are specifically human. By this we do not necessarily mean that from the beginning their functioning is completely harmonized, or that there is no possible discord among them, but rather that there is among these powers, *one which is by its nature capable of governing the others*, and which must govern them, *reason*. As a matter of fact, it is capable of evaluating the relations between actions and their objects, i.e., between particular ends and the universal one, the Absolute Good, *which creates Liberty* and shows it *its duty*. That which unifies human tendencies is reason. Take away their subordination to thought, and unity is no longer realizable in man, for thought can not be subordinate to sensation which it infinitely surpasses. ¹⁰

* Translation of quotation taken from Hamelin's, *Essai sur les Éléments Principaux de la Représentation*, p. 477.

¹⁰ See T. Higgins, S.J., *Man as Man (The Science and Art of Ethics)* (Milwaukee: Bruce, 3rd printing, 1950). PP- 15-16.

Reason perceives the unity required by the very existence of man, but it is also aware, at the same time, of the multiple and divergent desires in man's tendencies. Therefore, it conceives the perfect man, which is man's final end, to be the unity of a whole, of a harmony, of an order. Thus, faced by tendencies each seeking and clamoring for its own particular good, it proclaims the profound will of every man, his moral law : Do good; realize yourself in perfection. Yes, but what is this Good, this beatifying and regulating order? Here a problem of knowledge must be resolved. To know *ourselves*, we must know the beings with whom we come into relation, and, in order to do that, we must know God, the Creator of all. The problem evoked by these relations, being completely resolved, the true good of man will be clear to him, and the moral law of his liberty completely known. In the present life, these problems are illuminated by only partial lights which are often obscured by shadows. They are the general abstract principles which reason formulates, even though their universality is always in opposition to the immediate experiences of sensible pleasures and of social and spiritual activities. The complete good of man is thought of only under its universal characteristics, it is not experienced in the concrete. This imperfect knowledge of what is the complete or supreme Good in the concrete makes free choice, as well as risk, possible for man. It is the very condition of the march towards perfection, the pursuing of the end. As long as this imperfect knowledge endures, no end can be attained or possessed as final. A man who would be objectively perfect, fully virtuous, would still be a man on the way, capable of defecting by fault. Even if he were supposed to be confirmed in good, he would continue to experience the struggle, or at least he would desire to see and taste that complete Good which is present, but is not experienced and is as if absent. In short, *the Truth*, which today is divined by reason's unveiling the moral unity of man's tendencies only in abstract principles, must be clearly manifested in a concrete experience. This must be done in order to confer upon this unified order which we suppose now realized, on this Law which we now suppose fulfilled, the conscious characteristics of a Supreme, Complete and Absolute

Good, so that the wise and virtuous man may be given the personal possession of his End.

Thus the general and last end of man is possible only in the order achieved by reason in differing tendencies. This final end could not be realized except in a knowledge of this harmony, as it has organized man completely. A partial knowledge of this order would not suffice. It would leave the intelligence in quest of a completion. It is *complete* truth which the mind seeks, and of which it has need, so that it can savor *its Good*, since it aspires to knowing all, and since man knows himself only in relation with all of being. This must be a truth without gaps of ignorance, unmixed with error, without the obscurities and uncertainties of doubt or of opinion — the unlimited, unadulterated, and certain truth.

However, we must here qualify our conclusion. The breadth of human intelligence is not equal to that of God, nor to that of a pure spirit. *We arrive at all being only by beginning with limited beings*, which are the data of our external and internal experience. It is only these data which we understand positively, and them alone. We know higher Wings by negation and analogy, without understanding them. Therefore it is not truth absolutely understood which our nature desires as its Final End. It is the truth and all of the truth *attainable by the natural light of our reason*. This light is of a higher order in the separated soul, but, in any case, nature can never have in itself the capability of the vision of the divine essence. Never will created reason have God Himself as its proportionate object."

|| St. Thomas seems to place in man a natural demand for the vision of God. According to him, the beatitude of man can be realized only in a vision of the Divine Essence, because man, when faced by an effect, wishes to penetrate deeply into the cause of it and his intelligence always seeks to know the essence of its object. "Ad perfectam igitur beatitudinem requiritur quod intellectus pertingat ad ipsam essentiam primae causae." (*Summa Theol.*, I-II®, q. 3, a. 8). One can find the same line of reasoning in regard to pure spirits. *S.C.G.*, III, ch. 50 : "Desiderium... praedictum (i.e. intelligendae veritatis) non quiescit, nisi ad summum rerum cardinem et factorem pervenerit." The other types of knowledge only excite the desire that much more "ad divinam substantiam videndam."

However, although this desire to see the Divine Essence may be natural for every intelligence, its realization is not within the power of

3. NOW THE COMPLETE NATURAL TRUTH, whose possession constitutes the natural beatitude of man, is the knowledge of himself, as he is in himself and in relation to all the real, as well as the knowledge of those beings of experience as they are derived from their First Cause, the Divine Love who has freely made them exist. This knowledge is of a metaphysical kind. Metaphysics then is simply the apprenticeship of our destiny.

As a matter of fact, experimental science, if it satisfies certain rational tendencies, is, by its method, a *perpetual movement* of going back from the conditioned to a conditioned condition. Therefore, scientific knowledge can not be the end of man. To maintain the contrary, as scientism does, would be "to foster the illusion which confuses the race with its end, and to place our final end in action" (E. Gilson, *St. Thomas Aquinas*), because this science is, above all, an action which reconstructs things, a "work" of reason, mathematical science is likewise a "rational action" in its demonstrations.

any created substance (*S.C.G.*, III, ch. 52); it is a completely gratuitous gift from God.

How can we reconcile these two theses? How can a desire be natural and at the same time unrealizable by any natural powers? Would it not be like matter disposed to the reception of a human soul and not being able to produce it, like a separated soul summoning its body to live again and not being able to resurrect it? No, because this desire would then be a veritable exigency for the intuitive vision, and it would then, although produced by God, be the object of a right for every intelligence. This would be equivalent to denying the existence of the supernatural by denying that which is proper to it. On this problem, read *Dictionnaire de Théologie Catholique*, art. by A. Michel: "Intuitive (Vision)." cols. 2356-2359; R. Garrigou-Lagrange, *De Revelatione*. 2nd ed.. PP- 37<-398-

By this "natural desire of intelligence," St. Thomas means, at least, the unlimited scope of the object of the intellect, which excludes absolutely nothing, and consequently the disposition of intelligence to a completely supernatural illumination which shows it the very essence of God. This is what is called, in short, "obediential potency" to the intuitive Vision of God. See J. Maritain, *Approaches to God* (New York: Harper, 1954). PP- 109-114, who sees nothing more here than the desire to see God.

Could reason alone recognize in this desire its possibility? It could think of it as an hypothesis, but reason would much more easily find this hypothesis unlikely, because it is not built on any sound foundation. See *Dictionnaire de Spiritualité*, art. "Désir," cols. 932-940.

This is also true of its axiomatic beginnings whose definitions give rise to the mathematical object. Yet it is undoubtedly contemplative in its terminal conclusions, which perhaps may excuse the Platonizing tendency of Brunschvicg who sees in mathematics the highest ideal of the human mind. Nevertheless, mathematics contemplates only an abstract and purely possible object, which remains largely indifferent to the immediacies and exigencies of human life, since it is far from furnishing man with any information about his first mover or last end.

Neither experimental science nor mathematics is capable of furnishing us with a vital, i.e., a moral truth, because they consider only fragments of the universe of beings and, therefore, they have nothing to say about an absolute Good. Now, in order that reason unify all human tendencies, it must put them in an order of relation to their Supreme End, the Absolute Good. This Absolute Good must be known as a concrete reality. The discovery of this Good is the proper task of metaphysics, which is only reason pursuing to the very end its own exigencies. When reason has grasped God, it has grasped that which is the First Being, the First Good, the Absolute Good. 12

Then it knows that the rational good is not a phantom, but Being itself, that the moral law is not an illusion, but the perfect adaptation of human liberty to the divine liberty, which alone constitutes the vivifying union between God and man. Because the mind knows this, it has the certitude that all the tendencies, even those which chafe at the moral law, will find their fulfillment in the perfect triumph of the Good over them.

Thus, through metaphysical knowledge, man attaches his desire, his action, his movement, to his Final End. When the movement is accomplished, he will possess this Final End. This could not come to pass unless he would know what he aspires to know. His end, then, is the perfect affective and contemplative

" Let it be well understood, that it is not man's mode of metaphysical research which constitutes terminal knowledge. Conceptual thought is only the organ for coming to the light, as a chrysalid cocoon is for the cicada. " Never again will this Hying and chirping creature return to this envelope to renew its vital force or protect its wings. " (M. Blondel, *La Pensée*, II, pp. 439-440).

knowledge of God, the First Cause of human becoming. This particular knowledge of human becoming carries with it a knowledge of cosmic becoming with which it is closely linked. Briefly, then, man's final end is a knowledge of God, as the Provident Creator of man and the world.

C. THE immortality of man would seem to be the natural consequence of his destiny, because this destiny is not of the temporal order. On the one hand, the intellectual knowledge which constitutes it is essentially independent of extension, and therefore of the succession of time. On the other hand, the object of this contemplation is not changing and ephemeral. It is the eternal and immutable God. What reason could there be for man ever ceasing to exist?

The fact of death, however, is indisputable. But this fact is an enigma for reason, as well as a great distress to sensibility.

1. *The mystery of death* is multiple.

a. Its possibility and its cosmological necessity are evident to him who knows that man is a composite substance, a temporal being incorporated into the world, engendered and destroyed according to the most universal cosmic law, that of change.

Prime matter, which lies at the base of his substance, is capable of very many other specific perfections. It even aspires to them, if we consider it concretely at the core of the nature which surrounds it and influences it. The death of man is a simple event of nature, a single moment of universal time. Will man ever come to the day when he can dominate the universe which involves him in death? Will he be able, then, to cure his mortality by some "oft-dreamed of" alchemy? Reason does not force us to the conclusion that this is impossible. That which can die, can also not die. Take away the causes of death and death need not happen. However, this hypothesis is without a scientific basis. Science supposes man to be mortal by nature, yet this hypothesis supposes that it is possible that he would never die. The grafting of endocrine glands to avoid the aging of organs, which might have given some hope of realizing rejuvenation, had to be abandoned.

The fact of not dying, however, would not be a solution, *since the natural possibility of dying* would remain, and this would always have to be reconciled with the eternal natural end of man. The problem would still exist in regard to those who are dead; how are they able, nevertheless, to realize their destiny?

b. Ontological enigma. On the one hand, if we look at man as another being-in-the-world, his death seems so utterly natural, that it ought to be intelligible, that it ought to have its finality and make its contribution to the greatest good of nature and of man himself.

On the other hand, if we look at man transcending nature by his completely spiritual life, how can we consent to the judgment that he should die, and be reduced by his death to the dimensions of a material being?

"The intellectual act is indifferent to time. That which is true is characterized by universality and timelessness, therefore, the mind which thinks belongs to a world which is higher than the one of simple duration, of becoming, of gradual loss. Consequently, between the life of thought and the disappearance of a thinking being, there is a kind of incompatibility. Hence the scandal to reason, the instinctive revolt of our consciousness, the strange facility with which we, who are certain of our impending mortality, look upon it willingly as something hypothetical, unreal, uncertain and strange to our concrete preoccupations.

"If it is true that the best is the strongest, we must here say: *Major pars trahit ad se minorem*. Now, does not our intellectual timelessness lift up with it and carry within it our material infirmity? How is this possible? ||

c. Death appears to the existentialism of J.P. Sartre as being a psychological absurdity. ¶4 Here, he is not in accord

"This entire paragraph is taken from the section of M. Blondel's, *La Pensée*, wherein he treats of the metaphysics of death, p. 245.

¶4 *Ibid.*, p. 246.

*» J. P. Sartre, *Being and Nothingness* (New York: Philosophical Library, 1956), pp. 531-548. The numbers preceded by the initials B.N. refer to this work.

with Heidegger for whom man is a "being-for-death," who, in accepting resolutely this absurd destiny, must await death stoically and freely make it his.¹⁰

Sartre, on the contrary, sees death from any aspect as being inhuman. For man's consciousness it can neither be a means nor an end.

It seems to be an end. "Death is a human phenomenon; it is the final phenomenon of life, and the act of dying remains life. As such it influences the entire life by a counter-current; life is limited by life.... *Death* becomes the *meaning of life*, as the resolved chord is the meaning of the melody.... But this healing of death becomes *mine*... it is the phenomenon of my personal life which makes this life a unique life, that is, a life which does not begin again, a life in which one never again finds his stroke. Hence, I become responsible for *my* death as for my life" (B.N., p. 532).

But no: death is not an end that I can conceive, choose and await: "the unique quality of death is that it can always suddenly surprise those who wait for it at such and such a date (B.N., p. 536).... By determining it for me, chance removes from it any character as an harmonious end (B.N., p. 537). Thus, "death is not *my* possibility of no longer realizing a presence in the world, but rather an always possible nihilation of my possibles, which is beyond my possibilities" (B.N., p. 537), i.e., outside the field of my liberty, outside my personal ends.

Would death at least be a means, an awaited signal of the future? In this it could have meaning. It would be understandable by that characteristic which is the very same as life itself, for "our life is only a long waiting: first a waiting for the realization of our ends (to be engaged in an undertaking is to wait for its outcome), and especially a waiting for ourselves (even if this undertaking is realized... it remains for me to determine the place, the meaning and the value of this very enterprise in my life).... To be one's self is to come to one's

* See *Christianity and the Existentialists*, ed. by Carl Michalson (New York: Scribner, 1956), pp. 102-115.

self. These waitings evidently all include a reference to a final term in which would be waited for without waiting for anything more. A repose which would be being and no longer a waiting for being.... By means of this final term... we should know forever whether a particular youthful experience had been fruitful or disastrous..., the curve of our life would be fixed forever. In short, the account would be closed " (B.N., pp. 537-538). *One would be*, finally, *what one has been*. Death would thus be the means of unveiling that which I am, and would confer its definitive meaning on my whole life.

But no. In order that death terminate *my* life, it must happen with the consent of my liberty : for " if one minute more or less may perhaps change everything, and if this minute is added to or removed from my account, then even admitting that I am free to use my life, the meaning of my life escapes me. Now the Christian death comes from God. He chooses our hour... the minute of my death is not fixed by me — the sequences of the universe determine *it*.... Since death does not appear to be based on our liberty, it can only remove all meaning from life " (B.N., pp. 538-539). Hence, its absurdity.

Would we be able to restore liberty in the phenomenon of death by suicide? This is impossible : " Since it (suicide) is an act of my life, it actually requires a meaning which only the future can give to it, but as it is the last act of my life, it is denied this future. Thus it remains totally undetermined.... Suicide is an absurdity which causes my life to be submerged in the absurd " (B.N., p. 540).

worse still. Death not only deprives me of my personality, it delivers me to others. It is the Other who keeps my life dead, who reconstitutes it or forgets it, who confers an importance on it and modifies it by memory and appreciation. " To be dead is to be a prey to the living.... To die is to be condemned... to existing only through the Other, and to owing one's meaning to him " (B.N., p. 544).

" Thus... far from being my proper possibility, death is a contingent fact which, as such, escapes me by principle (B.N., p. 545).... There is no place for death in being-for-itself; it

can neither wait for death, nor realize it, nor project itself towards it.... What then is death? ... nothing other than the given. It is absurd that we should be born, it is absurd that we should die.... We always die in the bargain" (B.N., pp. 547-548).

All this can be summed up as follows : dying does not concern me, since death does not enter into the projects of my liberty. As long as death is there, I no longer am. This position which was that of Epicurus contains this acknowledgement that death goes beyond the experience of man. It could not be accepted as a sufficient explanation, if the only access to reality is experience. Sartre assures us of his position : " These remarks... are not derived from the consideration of death but, on the contrary, from the consideration of life; this is because the for-itself is the being which always lays claim to an after, and there is no place for death in a being which is for-itself " (B.N., p. 540). One can not dismiss the absurdity of death by enclosing himself in a pure description of temporal life, and by demanding the perpetuation of its before-after rhythm. He must, on the contrary, rely on the eternal which is already germinally present in living man.

We agree that death could not, in any case, be the final end of man. This would be a radical absurdity. But is there any reason that death could not have the reserved meaning of a partial unveiling of the life beyond? Could it not be looked at as a means of stabilizing a being who, up till now, has been groping? Thus, it would contribute to giving the present life a more precise meaning, a more determined and more urgent responsibility for the self, without leaving all definitive value to self, without attempting to draw values from the fact or the hour of death, but from the nature of life itself. The idea of my death remains vague. It is insufficient to indicate to me what my destiny will be, nor is it precise enough to reveal to me whether or not I shall definitely realize or lose my happiness. It is for me the forceful reminder of the urgency' of a good life, since dying well is the final act of a good life, and living well will lead me to dying well.

d. A life beyond death is, therefore, indispensable for taking away the seeming absurdity of death, and for solving the enigma it contains. If we do not put out the light of reason, we must affirm that man, in dying, passes to another form of life, where he is no longer man-in-the-world, object of temporal and spatial experience, but where he is still the same subject, conscious of his personal identity. Moreover, this is the almost unanimous conviction of religions, which is expressed in burial rites and in the cult of the dead, whether by traditions, imaginative myths or precise dogmas.

How can we conceive the possibility of a life beyond this one?

2. *The meaning of death*

a. Death is necessary for the completion of man.

It is incontestable that the present mode of our spiritual life must cease in order that we possess beatitude. Our present manner of thinking and willing is actually and essentially an advance towards a term. It must cease when we reach that term. As it is now, it foretells and prepares, but by the same token excludes the state of beatitude.

The proof of this is the central truth of psychology. I know myself, the world, others, and God, only through the medium of universal and essentially incomplete ideas. This constitutes a spiritual apéritif, but not a substantial meal.

Man must, then, be destroyed and rebuilt to enter into his beatitude. If it is not by death, it must be in some equivalent way.

" Can we not say that the worst possible fate for a man would be to be condemned to live indefinitely in the insecurity and in the physical and moral miseries of this world, where nothing is terminated except in expectations which deceive us, which are constantly being rolled up and are constantly falling down again like the rock of Sisyphus, where we find no single prevision realized, nor any single end completely attained? " 17

" *La PchSJe* of M. Blondel, II, pp. 233-240.

Let us consider these two hypotheses : (1) man continuing to live on this terrestrial planet without ever dying; (2) man ceasing to live on this terrestrial planet, either by death or by some equivalent transformation. The first hypothesis is absurdity itself, for it implies an advance which never gets anywhere, a search, forever illusory, for an always awaited happiness, a mirage which arises again and again without end, a thirst which nothing can slake, in a word, a man condemned to be only an embryo and never an adult — a pure abortion.

Death, therefore, must mean, in opposition to corporeal life, the access to another form of personal life.

b. The human soul is, actually, not destroyed by the death of man.

Immortal by nature, it survives the ruin of the hylomorphic composite. It acquires a new manner of knowing itself, which manifests its proper essence, its value as person, and its concrete relation with God. Through this new mode of knowledge it possesses its good, in the measure it has chosen so to do. The soul is stabilized at this level of being, and, knowing it, it knows itself at rest, in its term.

Nevertheless, it knows itself as being still partially unsatisfied, since it knows itself as a substantial form of matter, and, therefore, the soul demands that it take up again its function of form, but in a renovated body, reconstructed according to the order of perfection, completely penetrated with the radiance of the perfect soul with which it is now united. These are the principal points which remain to be explained and justified.

D. The immortality of the soul, which is the foundation of this solution, evidently can not be justified by direct experience. Communication with the "spirits" of the dead up until now has not obtained scientific verification. "There is room to wonder whether we have here a nascent science, or rather the embryo of a science which is dissolving." 18

Must we then postulate an affirmation incapable of verification? No, but we must build a rigorous metaphysical

* *Le Merveilleux Spirite* of L. ROURE, p. 344.

proposition on the solid basis of experience. This foundation has been verified by our study of the spirituality of man.

1. *The human soul is immortal by nature*, because it is spiritual.

Death is realized in two ways, in the living thing and in its constitutive principles. *In the living thing*, it is the rupture of the substantial unity of prime matter and the soul, which ends the existence of the composite. *As to the principles*, prime matter dies in the sense that it ceases to be able to exercise the vital operations, but it continues to exist under a new form. The soul dies in this sense that it ceases to exist when it loses the operative power which it held in conjunction with the prime matter which it determined. Souls which are not human die in that manner, because of the nature which is proper to them, when the living thing which they animate dies.

The human soul, on the contrary, can not die, because it has a proper existence. It subsists by itself. Man himself dies by the withdrawal of this existence which was communicated by his soul to his prime matter. But this existence is preserved, since it does not essentially depend on matter. w

It may be objected that the soul can not continue to exist without continuing to act, and, since matter is indispensable to its operations, even the spiritual ones, the soul, after death, ceases to exist.

Certainly the survival of the soul supposes the permanence of its operations. There can be no doubt, moreover, that organic and sensible operations are impossible for the soul after death. However, spiritual operations are possible because their dependence on matter is purely extrinsic. The soul had need of sensations in order that intelligence might put itself in act, in order that it might grasp the intelligible, in order that it might become aware of its existence and spiritual nature. Now, however, the soul knows in act its proper object, the universal, and its most immediate concrete and immaterial object, i.e., its own spiritual life and nature. Sensation can disappear, but the

soul keeps its spiritual acquisitions. Moreover, it is natural for the separated soul to think in a completely new way, which corresponds to its new manner of existence, “ and this consideration is more than an answer to the objection posed, since it clarifies the problem of the why of death.

As long as the soul existed as form, its intellectual operation would have a vital reference to sensation. Now that it exists as a “ separated ” substance, it must find in itself the proper object of its thought, since, being pure spirituality, it is intelligible in act. *It knows itself in its very essence.* There is nothing opposed to this, for that which, at the time of its union with the body, made it unknowable in itself and obliged it to know itself through its acts, was prime matter, which was the source of its potentiality and indetermination. Its acts were therefore necessary' in order to determine itself, in order to present itself with something of itself to know. Now the soul is only itself : *act*, and therefore knowable; *intellectual act*, and therefore knowing. It knows itself, and as this knowledge is direct and intuitive in the fullest sense of the word, *the soul knows itself to its very depths....* This is the first sendee which death renders it.

The soul knows itself by its own nature, and as it remembers itself, it also *recognizes itself* as being identical with its past. Therefore, it sees *all* its lived time in a simple act by which it does not cease contemplating itself — this might be considered analogous to a present psychological moment, when one sees his whole life pass by. Its appreciation of itself is as perfect as possible. Thus, the soul judges its degree of life, which either fills it with joy or sadness. *Moral sanction operates fully* and with perfect justice, because of the complete truth of this judgment. This is the second service which death renders to the soul.

¹⁰ On the mode of knowledge proper to separated souls, see *Summa Theol.*, 1^a pars, q. 89; *S.C.G.*, I. II, ch. 96 to 90 and I. III, ch. 49. God is not known in His essence, but as He is the cause of the soul. However, this knowledge is in no way a reasoning from the nature of the soul to its creative cause, but rather an intuitive grasp of the essence of the soul, penetrated to its depths by the action which created it, a little like a mirror endowed with consciousness which knows the characteristics of the face it reflects.

Finally, the soul, knowing itself perfectly, grasps within itself all the links which bind it to its Creator, to its Spiritual Guide. This is not an abstract grasp, but a concrete one. It is an experiencing of an individual relation between its being and the creative and regulating action which produces it and rules it. Furthermore, the soul grasps, through a form of analogy very much superior to our own, how all corporeal nature is only an effect, manifesting the Thought and Will of God. In this knowledge the soul finds its ultimate end. It remains eternally fixed in this knowledge, and since this knowledge is natural to it, it can never be lost. This is the third service which death renders to the soul. This new manner of knowledge, which belongs to the separated soul, gives it *a concrete knowledge of God*, as *-perfect* as is possible in a created nature.

Therefore, at the time of man's death, there is no reason for the human soul to die, and this death seems very useful for the possession of its end.

2. The human soul *naturally requires* that it *survive forever*. The survival which is proper to it is not a simple respite, it is a life pure and simple, a life without any possible death, and in this sense an "eternal" life. As a matter of fact :

a. Its natural end, truth, perfection, happiness, is of itself, i.e., by reason of its object, eternal. It would be a contradiction if a being were not in proportion to its final end. The perpetuity of the object corresponds then with the perpetuity of the soul's contemplation of the object. A soul destined to contemplate Eternal Truth must exist always. ²¹

b. The natural desire to live forever furnishes us with a proof, having a different aspect from the one we have just

« S.C.G., II, ch. 84. Could we not just as logically draw from this principle the eternal existence of the soul, an existence which is previous to its union with the body? St. Thomas answers : " Ex fine argumentum accipere possumus de rei duratione, sicut et de initio rei argumentari possumus per causam agentem." The destiny of a being actually supposes that the being already exists. It does not allow us to reason on its arrival in existence. On the contrary, it reveals only an aspect of its duration which is to come.

developed, but basically identical with it. It is one which is quite difficult to be presented convincingly.

In the *Summa Contra Gentiles* we find it given in this form : “ It is impossible that a natural appetite should be in vain. But man has a natural desire to exist always, which is clear in this, that being is what is desired by all living things. Man, however, by his intellect apprehends being, not only as a ‘ now ’ as brutes do, but he apprehends it simply. Therefore it follows that man, who by his soul apprehends being simply with no reference to any particular time, has perpetuity through this same power. ” “

The fact shows us a specifically human property, which therefore indicates the nature, the finality of the human soul. Man is the only being whose nature expresses simultaneously both the necessity of dying and the desire of never dying. To be aware of this desire, it is necessary both to experience time in its proper duration, and to think of time; in order to oppose a future different from the present, or life to the absence of life, there must be an intelligence. However, it must be an intelligence linked to time, thinking in time and having a relation to spatial movements which are measured by time, in short, an intelligence in the world, a human intelligence. Does a pure spirit think of time? Yes, but a pure spirit does not think of it as measuring its own life. On the contrary, he who desires to survive the flow of time desires to survive that moment of time which is death.

Moreover, this desire concerns a life which is held individually and consciously, i.e., personally. There would be no satisfaction for this desire, if the soul were absorbed into the God of the pantheists, any more than if its permanence were only in the memories of men, or in the progress of humanity, where Renan claimed to find true immortality.

Nevertheless, a doubt arises in our minds. Does a suicide have the desire to live forever. Seemingly not, and consequently the desire of which we speak does not seem to be universal.

How, then, can we dare assert that this desire is natural? The doubt can be taken care of easily. There are natural desires,, which man can contradict by voluntary desires. This is the very warp and woof of the moral life, in which free decisions are identified with or opposed to the natural law. Natural desire is truly manifested in man only through acquiescence to his being, his good, and his end. If the moral conscience energetically reproves suicide, we have here a new indication that nature wishes life purely and simply for man.

Now, does the fact that man by nature desires an eternal personal life, reveal anything to us about the reality of such a life?

The principle of finality demands an affirmative answer to this question. A natural tendency can not be in vain. As a matter of fact, the nature of a being is made up of the whole of its real possibilities. Every natural tendency is, therefore,, capable of being fulfilled.

Since the desire of living forever expresses the very nature of man, it must be because an endless life is really possible to him. Now, if the soul ceased to exist, nothing that is personal or individualized in man would subsist, for the matter of the body falls back through death into the common and undifferentiated patrimony of the universe. Thus, the human soul must not only survive the dissolution of death, but it must survive forever.

Summarily, in the instinctive desire for life, happiness and perpetuity, which colors so many of our efforts at knowing and loving, we experience the character of the soul. It is this character of the soul which we also experience in the disillusion that comes with every satisfaction which passes away. In this sense we experience ourselves as eternal. In the above, there is no finality, no purposiveness to these experiences, unless there is a final end orienting intermediary ends. Man feels that he is made to exist forever in experiencing the flight of his thought and will, which nothing finite can satisfy, because he knows himself to be made for eternity.

3. The soul *will never cease to exist*. This assertion would seem to be superfluous, since the nature of the soul is to live forever. If we recall that the soul is not sufficient of itself to exist, but has its being from a Creative Cause, God, the statement is not so superfluous as it seems. Since God has created it freely, can He not as freely annihilate it by a mere cessation of His creative love?

If we consider the creative power of God, abstracting from His other divine attributes ("*de potentia Dei absoluta*" and if we consider the wholly created and contingent existence of the soul, abstracting from its immortal nature and its acquired merits, the annihilation of the soul does not seem to be a contradiction. If, however, we consider God such as He is in all His attributes which are really identical to His Power ("*de potentia Dei ordinata*"), and if we consider the soul as it is in itself, the annihilation of the soul would be a completely monstrous event. Thus the hypothesis of annihilation is impossible.

a. ON the part of god, because His real Will, His free choice, is manifested in the natures which He has created, in their natural destination. He has willed mortal natures to be mortal, and immortal ones to be immortal. Therefore, He wills that the human soul should never perish, since He has made it naturally imperishable and capable of existing eternally.

To pretend the contrary would be to suppose that God is not *wise*, not having foreseen that which would result from His action, and desiring now to change it; or that He is not *almighty*, since He is obliged to create an immortal soul which He wished to be mortal; or He is not *good*, for He gives only to take back.

b. on the part of the soul, because *moral sanction* would not be possible, and God would lack justice if survival did not exist or would be limited by annihilation of the soul. As a matter of fact, if there were no survival after death, there could be no other sanctions than terrestrial ones. Now, these obviously are not in proportion to moral merits. Without survival in eternity, there would not be a just nor perfect sanction for human and moral activity. Moral activity is intrinsically concerned with an eternal value, that of its agreement or

disagreement with an *absolute and immutable Good and final end*. All merit and demerit in the moral order exact in justice an eternal joy or an eternal pain. Therefore, the soul must continue to exist forever in order that Divine Justice be fulfilled.

The annihilation of the soul is, therefore, an impossible event. But this would be the only way in which the soul could cease to exist, for the soul has its existence from God alone. No created cause can destroy it, as no created cause can construct it. The soul, being spiritual, can neither be produced nor decomposed. Created causes are limited to transforming and rebuilding by their destructive action.

A free gift of God, the life of the soul is an everlasting gift.

However, the problem posed by death is not entirely resolved. Man has not possessed his end before death, and though the soul be immortal, the end of man must be the end of a human nature.

E. The resurrection of the body of each human being must be asserted as the solution to this last problem. Without this condition, nature would be frustrated in its end, it would be a tendency without direction, a movement without any rational basis.

Actually :

1. This final end which exacts perpetuity is not that of the soul alone, but *that of man*.^u Undoubtedly, that end is realized essentially in the soul in purely spiritual knowledge, but it is not realized there integrally, i.e., in the satisfaction of all human powers.

Now integrity is required in the possession of the final end, for to possess it incompletely is not to possess a truly final end.

¹¹ See *S.C.G.* 1. IV, ch. 79 to 82. ^{**} *Cuicumque... deest aliquid ad perfectionem, nondum habet felicitatem perfectam, quia nondum ejus desiderium totaliter quietatur.... Anima autem a corpore separata est aliquo modo imperfecta, sicut omnis pars extra suum totum existens (anima enim naturaliter est pars humanae naturae). Non igitur homo potest ultimam felicitatem consequi, nisi anima iterato corpori conjungatur* • (IV, 79).

The soul, then, must be reunited to its prime matter to reconstitute an eternal man, in order that human nature arrive at its final end.

THE SOUL ITSELF demands this reincorporation, ^{24*} because every nature demands that which is required to exercise *all* its powers.

Now a union of the soul with the body is required, so that the soul can exercise all its powers. Separated, it is an incomplete nature which craves its natural completion.

The union of the soul with the body is, therefore, a natural exigency of the soul. Because the soul is naturally substantial form, it demands the exercise of its definitive life as substantial form.

3. the natural moral order leads us to the necessity of resurrection, for the subject of sanction is naturally the very subject of merit.²⁸

Now the subject of moral merit is not the soul alone, but man. It is the whole man who makes a free decision, and, even though the soul plays a preponderant role in deliberation and choice, yet the organism with its tendencies and operations is also the hidden artisan of such deliberation and choice, and the consequent agent of its execution.

Naturally, then, it must be man and not the soul alone, who enjoys or suffers as a consequence of his free acts.

Because man is only one person, one single responsibility, he will be restored for either everlasting joy or everlasting sorrow.

a. *What will be the cause of the body's resurrection?*
St. Thomas thinks that *nature* cannot be the cause, but that it

“*“Anima corpori naturaliter unitur; est enim secundum suam essentiam corporis forma; est igitur contra naturam animae absque corpore esse. Nihil autem quod est contra naturam potest esse perpetuum; non igitur perpetuo erit anima absque corpore” (ibid.).*

*•“ In hac vita, homines, ex anima et corpore compositi, peccant vel recte agunt. Debetur igitur hominibus, et secundum animam et secundum corpus, praemium vel poena.... In hac vita (autem) praemium ultimae felicitatis consequi non possunt...; multoties etiam peccata in hac vita non puniuntur.... Necessarium igitur est ponere iteratam animae ad corpus conjunctionem, ut homo in corpore et anima praemiari et puniri possit” (*ibid.*).

must be God, considered as the author of miracles.⁸⁷ Who knows, however, whether or not God has given *the soul* the power to reanimate its own body in certain conditions?

Here we can not appeal to experience. All that can be offered is completely negative. Nothing we know of nature shows it capable of reviving the dead. However, we can not dispel all likelihood from the hypothesis of a spontaneous generation of life. Again, the human soul, in its state of union with matter, had the power of vitalizing and humanizing inert nutriments — through nutrition and differentiation. Can we not imagine, in the Providential plan, a moment of maturation for beings who would produce, by their own combined effort, the resurrection of humanity? The material universe actively aspires to its own end, and it will not realize it fully, except in resuscitated humanity. As to the universe of separated souls, each and all of them aspire to their completely realized end, their reincarnation.

b. Will *the state of resurrected man* be identical with that of his earthly state? Undoubtedly not. ¹⁸

1) It will be that of a being in possession of his end, arrived at the end of his voyage, no longer that of a destitute being or a traveler in search of his good. As man, body and soul, he will possess immortality, and thus be incapable of ever dying.

The metempsychosis * professed by the Pythagoreans, by Plato, by Buddhism and some modern theosophists, sees in death only an event without any profound importance, which does not touch the substance of man. Its basic error lies in its supposition that man is defined by his soul alone, which travels from body to body. Is there anything astonishing about its refusal to accept man's being placed in a final state by reason of death?⁸⁸**

" *Summa Theol., Supp.*, q. 75, a. 3.

*» See *S.C.G.* l. IV, ch. 83 to 85.

** See Maquart, *Elementa Philosophiae*, II, pp. 509-511.

E. J. THOMAS. *The History of Buddhist Thought* (London : Routledge and Kegan Paul, 1959), pp. 92-106; 119-132.

Why, no, the human soul is substantial form. Having arrived at its term by death, it is completed in this term by the resurrection of the body. The hypothesis of a further possible death would be absurd. A body, resurrected for the purpose of completing the perfection of the soul, must be henceforth incorruptible.

2) Resurrected man will evidently possess all the specifically human functions, corporeal as well as spiritual, but he will have the exercise of them only in the degree in which this exercise will be compatible with the state of end. Thus, there will be no need to use the functions of nutrition, of differentiation and of generation, which concern the construction and repairing of the body and the multiplication of the species. On the other hand, sensations and images will reconstitute man as a microcosm, summing up the world, and these will furnish the matter for his ideas. Let us be careful, however, not to attribute to resurrected man the discursive or reasoning process which now operates in his intellectual function. From the time of death, a higher light illumines the soul, a light which springs from its very essence. This light penetrates the images and makes them understood intuitively, in the same way that an intuition of genius gives a common event a meaning, a value, a savor, or, inversely, as a perverted will discovers, in an indifferent word or gesture, a malice which reflects itself. Moreover, the soul possesses this light constantly in relation to all its sensations and all its images. Everything is clearly intelligible through this light which is constantly shed on sensations and images.

To sum up : beatifying knowledge will be communicated in some way to the whole material organism, and, in this sense, the latter will be spiritualized. It is precisely towards this end that earthly man tends, if he knows how to evaluate and satisfy his own conscience, by dominating his passions and resisting temptations.

c. *The individuality of the resurrected body* ought to be the same as that of the earthly body. It would be impossible to blend in one same substance a soul whose individual existence remained the same and a body which would have some other

individuality. As a matter of fact, matter and form have one and the same existence in a substance.

Yet how can a soul be restored to a body which is exactly the one it had before death?

Some of the difficulties which arise here are : (1) the thorough decomposition of cadavers; (2) the ashes of remains scattered to the four winds; (3) the replacing in cosmic, biological, and... human circulation, of that which was this man; (4) and even worse, cannibalism, which gives the same material elements as a body to a number of individuals. There are so many difficulties here which appear insurmountable, that they seem to make the idea of resurrection ridiculous. How can each soul be reunited to its own proper body?

Moreover, man's material organism is completely renewed many times in the course of his life. Now precisely what renewal among these is to be united to his soul? Are we going to say that all matter will, on one day or an other, be vivified by a soul? What an extravagant volume that would be ! Only a part of that matter? What part then?

The more problems are multiplied by the imagination concerning the resurrection of the body, the more we must be convinced that the solution of these problems is beyond the reach of imagination. This problem can be answered only in the highest reaches of metaphysics.

Individuality 31 is known in two ways : (1) it is *fdi* and imagined. Thus, there is the individuality of a contour, of

S.C.G., IV, Si, 2nd obj. " Corporeitas... dupliciter accipi potest. Uno modo secundum quod est forma substantialis corporis.... Oportet igitur quod corporeitas, prout est forma substantialis in homine, non sit aliud quam anima rationalis, quae in sua materia hoc requirit quod habeat tres dimensiones : est enim actus corporis alicujus. Alio modo accipitur corporeitas prout est forma accidentalis, secundum quam dicitur corpus esse in genere quantitatis.... Etsi igitur haec corporeitas in nihilum cedit, corpore humano corrupto, tamen impediri non potest quin idem numero resurgat, eo quod corporeitas primo modo dicta non in nihilum cedit, sed eandem manet. "

This answer seems very much more acceptable than the ones which St. Thomas adds to it, wherein he accepts the viewpoint of the objector and attempts to find again, in the immense universe, at least one material particle which belonged to a single human being. We cannot see the

a local and temporal situation. It is "this thing here at this moment," which is an accidental individuality. We are not concerned with this type of individuality at the moment. In this sense, a cadaver is the same "individual" as the body which was just now living. (2) *Individuality is thought of.* Here it is on the level of a substantial existence, identical with itself and distinct from every other. It is this individuality which concerns us in this question, and with this distinction in mind, we are in a fair way to solving the problem.

Here we have a soul which has kept its individual existence. At a time and in a manner, which God knows, this soul reanimates prime matter, i.e., communicates to it its proper existence, its proper life. This existence, this life, is the same as that of the man who died and is now resurrected. This matter, whatever may be its sensible individuality and its substantial individuality at the previous moment, is now changed substantially and acquires a *new* individual existence, that of the soul which takes possession of it as its substantial form. Here again the *soul-form* is the indispensable key. If the body is of itself substance, it is also an individual. How can we guarantee or recover the individuality of that body such as it possessed it before death? But the soul is form and subsistent. Its individuality, guaranteed by its subsistence, has only to be communicated to a matter, which will be changed substantially, losing its previously existing individuality, to become the soul's own body and endowed with the soul's own individual existence.

What is the source of the dispositions which adapt this reanimated matter to a particular soul? Without any doubt, it is God. Does He avail Himself of the services of nature for this task? Nothing seems to indicate it, nor does anything oblige us to exclude it as a possibility. Does He use the soul? Very probably. For if, at the moment in which man was first formed, natural causes and parents molded the matter, and if the dispositions of these latter called forth the creative action

advantage of this quantitative identification, especially as it is reduced to such a minimum. The most valuable of these answers is certainly summed up in the formula: "Quod defuerit, supplebitur omnipotentia Creatoris."

and were responsible for individualizing the created soul, this was done by reason of the particular type of substantial form which the human soul is. Because of this particular characteristic it has as form, the soul calls its body to life again. It restores to the body the individuation which the soul had first received in its creative union with the body, by communicating to it its preserved existence.

" In its first generation, the creation of the soul follows the generation of a body;... in the resurrection, however, the body shall be joined to the preexisting soul. " 32

The substantial compénétration of any prime matter by the soul-form will introduce into the living being individuating determinations exactly proportioned to the individuality of the soul " informing " it. Thus the body will be the same as before, because the soul to which it will be substantially united has remained individually the same.

Thus, *immortality* will be *personal* in the fullest sense of the word. Human nature will be reconstituted, and the human person restored. The Final End will be possessed by man in his complete nature.

Beatitude will thus be perfect. The happiness of perfected man will consist in this, at least if men have willed it so, that the Creator will be clearly manifest in His most perfect corporeal work : man, the *Glory of God* realized.

CONCLUSION

Man is a movement, but of what kind? Whence did he come? Where is he going? These are very practical questions because of their moral extension, but they are in themselves theoretical ones. Moral action must adapt us to reality such as it is.

The only philosophical method which will allow us to resolve these problems must have, as its starting point, the data of internal and external experience. This method consists in

analyzing the data without distorting them, in considering the aspects of the ego one by one without isolating them, and with a careful regard to keeping them linked to each other.

Man is unveiled as *a movement* made up of a multitude of partial movements, *of acts* reducible to a small number of types or kinds. *The fundamental kind of acts* is that of the acts of *knowledge*, which are the basis of man's activity and affectivity. Knowledge and love are realized in him in two irreducible ways, one sensible, the other intelligible. That which is the *distinctive mark of man* among the other beings of nature is his *intelligence*. The nature of intelligence in man reveals what man is.

The formal and essential object of human thought is the universal grasped in the sensible. Through it is discovered the spirituality as well as the materiality of man.

The soul which makes man a living thing *is spiritual and subsistent*. It can not be *produced* by natural causes, but only by the Almighty Power of the Creator. It is *immortal* and will never cease to exist. *Its natural destiny* is eternal *beatitude* found in its contemplative and loving possession of God.

This soul, *however*, is not a pure spirit. It is the *substantial form* of a body which it organizes, vivifies, sensitizes, and subjects to ideas which are freely chosen.

Soul and matter make of man only one substance, *one single nature*. Together they have but *one definitive destiny*, one same Final End. It is a personal and moral end, i.e., an end acquired by free operation. *Man is a moral person*.

Thus, morality is founded on the basis of an obligatory law (closed morality), and on the basis of a good which tends towards an ever increasing amplification up to the Sovereign Good (open morality).

The following problems are ones for which psychology has prepared the solution.

1) *The moral problem*: What is obligatory? What is the good? — The answer is to be drawn from the nature of man and his destiny.

2) *The problem of God*: He exists as the Author of Nature and the Creator of the soul, *but what is He in Himself?* Psychol-

ogy helps us to conceive the life of a pure spirit, who is Pure Act, and perfectly free in His creative love.

3) *The -problem of critique:* Man, through his knowledge, his action and his joy, is united to objects and, at first, to things. *How is that unity possible?* Psychology gives the key to the problem by demonstrating an essential intuition in knowledge.

4) Finally, a *problem of ontology*: What is the final, *definite reason for this union between man and things?* Psychology sees the proximate reason in the substantial forms constituting men and things. Ontology will achieve the explanation by showing that these forms are participations in the Divine Ideas, and ultimately in the Divine Essence.

APPENDIX

TWO ATHEISTIC HUMANISMS

I. MARXISM

A. Marxist psychology?

1. "Marxism is not a philosophy... it is not reducible to a philosophical humanism.... Marxism is a scientific sociology implying a history, an economical theory and a science of politics." Undoubtedly, "there is a Marxist philosophy," but "this philosophical work is incorporated into science."¹

We must add that "it implies an action," because it is a conception of the world, i.e., "a view of the whole of nature and man, a complete doctrine."²

2. This philosophy, however, is dialectical. Its concern is not with discovering the universal essence of man, but with analyzing the intimate contradictions of man, which move history. "According to the Marxist dialectic... man always appears differently to himself and to others in different times and places."³ "For us, natures and eternal essences are nothing more than a *series of relations*. The relation which appears fundamental to us in the question which concerns us is the relation between man and the universe," a practical and collective relation.⁴

"From this it follows that the fundamental relation is *the social mode of production*."

¹ H. Lefebvre, *Pour Connaître la Pensée de Karl Marx*, p. 46. There is an added nuance to this evaluation which appears in G. Wetter, S. J. *Dialectical Materialism*, pp. 249-256.

• H. Lefebvre, *Le Marxisme*, p. 7. See also G. Wetter, S. J., *Dialectical Materialism*, pp. 256-267.

² P. Hervé, *Les Grands Appels de l'Homme Contemporain*, p. 82. Wetter, in his *Dialectical Materialism*, shows how this idea is rooted in what Stalin calls the second principal feature of the Marxist dialectical method, (pp. 314-3x9).

* P. Hervé, *Les Grands Appels de l'Homme Contemporain*, pp. 87-88.

Thus the essence of man is revealed by a study of the modes of productivity. This, then, will be an essence which varies according to social structures. Thus man must be considered successively in a slave society, a feudal one, a capitalistic one and a socialist one.

3. There is no psychology in Marx and Engels, according to the opinion of P. Naville. Nevertheless, there is room in Marxism for a psychological science. * However, " in our society and at this present epoch of human evolution, it is social analysis with a Marxist interpretation which almost always projects essential lights on psychology.... The delicate problem is the " mechanism " behind that projection. " •

The preferred scientific method will, of course, be that of " comportment or behaviorism. "

The content of psychological science is used as a confirmation of the dialectic. The principle of quantity being transformed into quality, for example, is confirmed by the different psychic thresholds. The principle of the union of contraries is illustrated by the fruitful conflict of the organism with nature, but especially in the instances when technical conditions modify nature. The same is true when we consider the internal tension which exists between the affective and intellectual poles in the individual. '

4. In order to recognize the metaphysics which inspires Marxism, it is not sufficient to read the explicit theses which are materialistic. We must look for the implicit ideal which has dictated these theses, which is a humanism closed to all divine influence.

B. The alienated man is the real man in the eyes of the Marxist.

* P. Naville, *Psychologie, Marxisme, Matérialisme*, pp. 308-310.

• *Ibid.*, p. 41. The extreme delicacy of this problem is clearly brought out in Wetter's *Dialectical Materialism*, pp. 473-487.

' H. Wallon, *Matérialisme Dialectique et Psychologie*, pp. 21-22. This position is evaluated and criticised by Wetter in *Dialectical Materialism*, pp. 469-487, and especially pp. 486-487.

1. *Man is specifically distinct from nature.*

a. This thesis is not held in order that materialism be denied to the advantage of spiritualism, for, as *Lenin* says : " The materialist elimination of the * dualism of spirit and body ' (i.e., materialist monism) consists in the assertion that the spirit does not exist independently of the body, that the spirit is secondary, a function of the brain, a reflection of the external world. " *

Nor is this denied by *Engels*, who writes : " Matter is not the product of mind, but mind itself is merely the highest product of matter. " *

b. However, the Marxist materialism is dialectic and admits a qualitative progress. Man, the last product of the evolution of matter, is its highest product. In what does his superiority consist? In two productive functions :

1) " Men themselves begin to distinguish themselves from animals as soon as they begin to produce the means of life, a step which is conditioned by their bodily organization. In producing their means of life, men indirectly produce their material life itself. " 10

2) " The same men who establish the social relations which conform to their material productivity are also responsible for the principles, ideas and categories which conform to their social relations. " 11

Here material production dominates the world of ideas. The first is the under-structure of society and the second is the super-structure of it. " The ideas of the ruling class are the dominant

* See E. Baas, *Introduction Critique au Marxisme* (Colmar, Paris : Editions Alsatia, 1953). This work contains a great number of pertinent and important quotations from Russian thinkers on the philosophical foundations of Communism. The quoted passage of Lenin is found in his *Materialism and Empirio-Criticism*, p. 86.

» F. Engels, *Ludwig Fierbach and the End of German Classical Philosophy* (Moscow : Foreign Languages Publishing House, 1950). P. 30.

10 K. Marx, " The German Ideology, " as found on page 8 of *Capital and Other Writings* (New York : Carlton House, 1932).

11 *Ibid.*, p. 8. See also *Political Economy* and the quotations taken from the work cited in the previous footnote.

ideas in every age. In other words, the class which represents the material power dominating society is at the same time the spiritual power which is uppermost in that society. " "

c. The dialectic asserts also the reciprocal action of economic structures and ideas. " And it seems to me obvious that this inversion, which, so long as it remains unrecognized, forms what we call ideological conception, reacts in its turn upon the economic basis, and may, within certain limits, modify it. " 13

d. To be a little more precise, the idea determines a change of form in the matter, and is realized there especially as a conscious and willed end. " .. a bee puts to shame many an architect in the construction of her cells. But what distinguishes the worst architect from the best of bees is this, that the architect raises his structure in imagination before he erects it in reality. At the end of every labor process, we get a result that already existed in the imagination of the laborer at its commencement. He not only effects a change of form in the material on which he works, but he also realizes a purpose of his own that gives law to his *modus operandi*, and to which he must subordinate his will. " 14*

Thus, there seems to be in man something which is incommensurate with nature and animal.

e. However, " the mode of production of material life conditions the social, political and intellectual processes in general. It is not the consciousness of men that determines their being, but, on the contrary, their social being that determines their consciousness. " 18

Although man is superior to the rest of nature, he, nevertheless, remains within the limits of matter.

M Sec " Idéologie Allemande, " *Œuvres Complètes de Marx*, I, 5, P- 35-

u F. Engels, " Letter to C. Schmidt, Oct. 27, 1890, " found in *Marx-Engels, Selected Works*, Vol. II, p. 494.

14 K. Marx, *Capital*, ed. by F. Engels, Great Books Series, Vol. L, Marx (Encyclopedia Britannica Inc., 1955), Part III, ch. 7, p. 85.

M K. Marx, " Preface to a Contribution to the Critique of Political Economy, " as found in *Marx-Engels, Selected Works*, Vol. I, pp. 362-363.

f. That which characterizes man is not thought, but his work. Men are different from the others in nature by their manner of working. Human work dominates nature. By developing the worker, it even progressively creates man.

" The use and fabrication of instruments of labor, although existing in germ among certain species of animals, are specifically characteristic of the human labor process.... It is not the articles made, but how they are made, and by what instruments, that enables us to distinguish different economic epochs. " 16

" By work, man becomes himself. Work is the ' becoming of self ' for man, whether at the interior of alienation, or as an alienated being. " *

" Relative to nature man himself plays the role of a natural power. The forces with which his body is endowed are set in operation by him to assimilate material things by giving them a form useful for his life. " 19

" At the same time that he acts on external nature and modifies it, he modifies his own nature and develops the faculties which are dormant there. " 19

g. Finally, human work on nature can be realized only by cooperation and division of tasks. In doing this, it makes and shows man to be a social being, a member of humanity.

" By their very activity, human individuals enter... into determined relations which are social relations. They can not be separated from these relations. Their existence even depends on them to the extent that they constitute the very nature of their activity, its limits and its possibilities. This is only to say that their consciousness does not create these relations, but that it is on the contrary involved in them, and therefore determined by them.... It is social existence which determines consciousness and not consciousness which determines social existence. Thus a peasant has the consciousness and ideas of a peasant. "

* K. Marx, *Capital*, Part III, ch. 7, p. 86.

T K. Marx, *Manuscript*, 1844, *Œuvres Complètes de Marx*, Vol. I, 3, p. T56.

* K. Marx, *Capital*, Part III, ch. 7, p. 85.

* *Ibid.*, p. 85.

The fundamental relations of all human society, then, are the relations of production.²⁰

In short, man emerges from nature by his manner of working, which makes him a social and conscious being.

"Thus," writes E. Baas, "a new image of man emerges, which tends to take the place of the wise man of antiquity as well as that of the Christian saint, the image of a Promethean man who is truly man only because he has the power to make himself a man through work." ²¹

2. *Actually, however, man is alienated*, i.e., dispossessed of himself, has become inhuman :

"This is an essential and outstanding philosophical aspect of Marxism, although it is little understood." "It is at the heart of the Marxian political economy, which "appears as a becoming aware of this alienation and the conditions which will permit us to surmount it." ²³

Alienation is realized at three levels :

a. Fundamentally, at the *economic level*. Its origin, here, is the opposition which exists between man and nature in work. The product of work, the something which man has worked on, retains something of nature, a nature which is hostile to man. It "is going to be opposed to work, as if we had a case here of some foreign being, as if the product were a power independent of the producer." "The laborer places his life in the object, and then his life no longer belongs to him, it is an object.

This dehumanized product is, first of all, merchandise, then money, then capital. Work is no longer joyful, but tedious. Work no longer possesses, it is enslaved and forced.

b. At the social and political level. At the same time, humanity is broken up into *classes*, and the social existence of

¹⁰ H. Lefebvre, *Le Marxisme*, pp. 61 and 63.

²⁰ E. Baas, *Introduction Critique au Marxisme*, p. 121.

²¹ H. Lefebvre, *Le Marxisme*, p. 37.

²³ P. Bigo, *Marxisme et Humanisme*, p. 27.

M Ibid., pp. 27-34.

the individual is not only diminished, but it is turned into a hostility, wherein the class of "haves" seeks to further enrich itself and extend its domination, while the dispossessed class (the "have-nots") seeks to regain its indispensable means of living.

The state installs itself as the promoter of peace and justice, but it is only a new means of domination for the class of possessors over the men who have been dispossessed of the product of their work.

"The state is the product and the manifestation of the *irreconcilable* antagonism of the classes. The state appears where the antagonisms of the classes can not be objectively reconciled, and in the measure that they can not be. Inversely, the existence of the state proves that the contradictions of the classes are not reconcilable." 28

c. At the ideological and, especially, the religious level. Here, Marx and Engels depend on Feuerbach and correct him.

According to Feuerbach, man, by reason of his desire for happiness, creates God as the perfect personification of that of which he feels himself deprived, being, knowledge, holiness, power. Then he alienates himself in the adoration and love of this God. These acts lead him to renounce himself and the love of others. Finally, he retrieves his losses by imagining that God gratuitously sanctifies him and fills up what is wanting in him in an afterlife.²⁴

According to Marx, Feuerbach did not have the correct view on the source of religion. This ideology of alienation is founded on *private property*, for which God becomes the policeman in the mind of the possessor, and the compensation in the here-after for the heart of the dispossessed worker.

"V. I. Lenin, "The State and Revolution," taken from Lenin's, *Selected Works*, Vol. VII, (New York: International Publishers, 1943), p. 8.

* L. Feuerbach, *The Essence of Christianity*, Eng. tr. George Eliot (New York: Harper, 1957). Read pp. 1-32. See also De Lubac, *Drame de L'Humanisme Athée*, pp. 23-29. and F. Grégoire, *Aux Sources de la Pensée de Karl Marx: Hegel et Feuerbach*, Louvain, pp. 148 ff.

In this sense, " religion is the groaning of the creature struck down by misery, the soul of a world without a heart, as well as the spirit of an age without spirit. It is the opium of the people. " "

Religion, then, simply reveals the alienation of man. It would fade away if this alienation would disappear. So Lenin will write :

" To forget that the religious oppression of humanity is only the product and reflection of economic oppression in the bosom of society, is simply a proof of bourgeois mediocrity. Neither books nor speeches will enlighten the proletariat, if it is not enlightened by the struggle which sustains it against the occult forces of capitalism. " And again : " We must combat religion. This is the A, B, C of all materialism and consequently of Marxism.... We cannot confine the struggle against religion to speeches..., we must link this struggle to the concrete practicing of class movement to wipe out the social roots of religion. " "

" The evaluation of heaven will thus be turned into an evaluation of earth, the evaluation of religion into an evaluation of law, the evaluation of theology into an evaluation of politics. " M

Thus, " all past history, with the exception of its beginnings, is the history of class struggle.... These antagonistic classes of society are always the results of the modes of production and exchange, in a word, of the economic conditions of their times. " ³⁰

Thus, " the alienation of man is not defined religiously, metaphysically or morally... it is not theoretical, but eminently practical, and is discovered in all domains of life.... On the real plane, alienation manifests itself by the fact that human beings are delivered to hostile forces, which are nevertheless only

* De Lvbac, *Le Drame de j'Humanisme Athée*, quoting Marx on p. 36.

* V. I. Lenin, *Religion*, (London : Lawrence Publishers, n.d.), p. 5. See also pp. 11-12. Read also C. Hollis, *Lenin*, pp. 100-125. See also N. Berdyaev, *The Origin of Russian Communism*, ch. vn, pp. 191-229.

" K. Marx, " Critique de la Philosophie du Droit de Hegel, " as found in *Œuvres Complètes de Marx*, Vol. I, 1, p. 614.

•• K. Marx, *Über Historischen Materialismus*, II, p. 185.

the products of their own activity, but they are turned against them and carry them to inhuman destinies — crises, wars, and upheavals of every kind. ”¹¹ This is equivalent to saying that alienation is viewed predominantly from the historical angle and not the moral one, as a moment in the becoming of mankind, and not as an injustice.

C. The liberated man is the man who attempts to make himself in the dialectical march of history. There are three stages to this march.

1. *The revolution of the -proletariat* characterizes the present stage, which is at the same time a becoming aware of the alienation and action tending to suppress it. “Communism is not, for us, a state which ought to be created, an ideal destined to give direction to reality. We call communism the effective movement which will suppress the present situation. ”³²

“While waiting, the antagonism between the proletariat and the bourgeoisie is a struggle of class against class, which, carried to its highest expression, is a complete revolution. ”^{**}

“The bourgeois system of production is the last antagonistic form of the social process of production.... The productive forces, developing in the womb of bourgeois society, are creating at the same time, the material conditions for resolving this antagonism. ”³³

As a matter of fact : “The proletariat, having arrived at the bottom, is stripped of all its humanity, indeed of even the appearance of humanity...; having lost everything in losing himself, the proletarian man... is directly forced... to become absolutely imperious by reason of this distress... to revolt against this inhumanity. ” “

» H. Lefebvre, *Le Marxisme*, pp. 39-41.

» K. Marx, “Idéologie Allemande.” *Œuvres Complètes*, Vol. I. 5, P- 25-

M As found in *Morceaux Choisis of Marx* (Paris : Gallimard), p. 168.

K. Marx, “Preface to a Contribution to the Critique of Political Economy,” *Selected Works of Marx-Engels*. Vol. I. pp. 363-364.

” K. Marx, “La Sainte Famille,” *Œuvres Complètes*, Vol. I, 3, pp, 206 ff.

" The possessor class and the proletarian class, each represent the same state of human alienation. The first, however, is complacent with the situation.... The second (the proletariat), feels itself, on the contrary, annihilated by this alienation, and sees there its impotency and the reality of an inhuman existence. There are..., in a downtrodden state, the seeds of revolt against it. " M

The fruit which ripens is, therefore, revolution. " The overthrow of the bourgeoisie can be achieved only by the proletariat becoming transformed into the ruling class, capable of crushing the inevitable and desperate resistance of the bourgeoisie, and capable of organizing all the toiling and exploited masses through a new economic order. " 37

From this point of view, communism is a moment in human history, when " man, having consciously found again his link with material nature, bursts forth in his natural vitality, yet with an unlimited power over this nature. This is a moment, where reason definitely emerges, organizes the human whole and goes beyond it.... The long natural process with its contradictions... which the formation of man was..., the moment when the multiple alienation... of humanity will diminish bit by bit, be absorbed and wiped out. " — " The cessation of alienation implies the progressive cessation and suppression of merchandise, capital and money.... It implies the cessation of private property... and private ownership of the means of production... Private property and private ownership of the means of production are actually in conflict with the social man's appropriation of nature. " 38

2. *The dictatorship of the proletariat* is the next stage of the movement of liberation, the antithesis of the bourgeois state, pushing to the absolute — by its dictatorial character — the principle of statism, in order to arrive at the final synthesis,

* *Ibid.*, p. 206.

17 V. I. Lenin, " *The State and Revolution, Selected Works*, " Vol. VII, p. 26.

" H. Lefebvre, *Le Marxisme*, p. 47.

è., society without a state. (This is the situation which is now being realized in Russia).

It is, says *Marx*, " the necessary transit point to the abolition of class distinctions generally, to the abolition of all the relations of production on which they rest, to abolition of all the social relations that correspond to these relations of production, to the revolutionizing of all the ideas that result from these social relations. "39

Lenin will insist on the necessity of this stage to achieve the ideal communist society : in order to prepare for the suppression of the state through an unlimited statism, to overcome the resistance of the bourgeoisie, and to educate the masses with a view to the coming classless society.40

Work will have a maximum socialization : " no one will any longer, by claim to private property, be able to retain possession of the means of production of tools or of machines. " 41

Religion will be as free as anti-religious propaganda. It will decline in the measure that alienation will be reduced and man liberated.

Engel/s justified this dictatorship in these words : " So long as the proletariat still uses the state, it does not use it in the interests of freedom, but in order to hold down its adversaries. "42

How long will this dictatorship last? The conflict between Trotsky and Stalin concerned the answer to this question. Stalin, faithful to the thought of Lenin, wanted it to endure as long as the union of bourgeois countries constituted a threat to Russian socialism, which would seem to be indefinitely.

3. *The new humanity*, the third stage, is not a Marxist promise, it is a prediction.

» K. M a r x , " Class Struggles in France, " *Selected Works of Marx-Engels*. Vol. I. p. 223.

40 See V. I. L e n i n , " The State and Revolution, " *Selected Works*. Vol. VII. p. 34. P- 24. PP- 78-83-

41 *Ibid.*, p. 85.

u *Ibid.*, p. 60. Here Lenin quotes a whole segment of F.ngels, *Letter to Bebel*, from which the above quotation is taken.

" It has never entered the head of any socialist * to promise ' that the higher phase of communism will arrive; and the great socialists, in foreseeing its arrival, presupposed both a productivity of labor unlike the present and a person unlike the present man in the street, who is capable of damaging the stores of social wealth ' just for fun ' and of demanding the impossible. " °

Future man will actually be one whom the machine and technique have freed from brutalizing tasks, — who has the leisure to alternate manual work with work of the mind, a man who, in the social body outside of which he is nothing, dominates nature by his work, and creates himself. In a word, a man who has become human again.

In the future society there will be no more classes, no more state. Dictatorship will have reduced the bourgeois class to nothing, and, because of that, suppressed the proletariat as an opposing class. The proletariat, having suppressed the old conditions of production by violence, will have " swept away the conditions for the existence of class antagonisms and of classes generally, and will thereby have abolished its own supremacy as a class. " ¶

For the same reason so will the state be suppressed : " political power, properly so called, is merely the organized power of one class for oppressing another. " 45*

" In place of the old bourgeois society, with its classes and class antagonisms, we shall have an association in which the free development of each is the condition for the free development of all. " 44

" The government of persons is replaced by the administration of things and the direction of the process of production. The state is not ' abolished, ' it withers away. " 47

" V. I. Lenin, " The State and Revolution, " *Selected Works*, Vol. VII, pp. 88-89.

44 K. Marx and F. Engels, *Communist Manifesto*, Great Books Series, Vol. L, Marx (Encyclopedia Britannica Inc., 1955), ch. it, p. 429.

44 *Ibid.*, p. 429.

44 *Ibid.*, p. 429.

47 V. I. Lenin, " The State and Revolution, " *Selected Works*, p. 17 Here Lenin quotes Engel's *Anti-Dühring*, Part III. ch. 2, from which the above quotation is taken.

And so that no one will object to the laborer's being deprived of liberty, and to his being guided by the community :

" When all have learned the art of administration and will indeed independently administer social production..., the necessity of observing the simple and fundamental rules of all human intercourse will very soon become a habit. "48* Work will be done by spontaneous need, with joy, and with a completely new mentality.

" Hence, the need for violence against people in general, the need for the subjection of one man to another, and of one section of the population to another, will vanish, since people will become accustomed to observing the elementary conditions of social life without force and without subordination. " 48

Two new factors make this new humanity possible, an extraordinary productivity in work and the suppression of classes :

a. " Work will become so productive that everyone will voluntarily work to his capacities.... The distribution of products will no longer demand that society assign to each the part of the products coming from him. Each one will be free to take according to his needs. " 50 A little like being free to take the air we breathe, or being free to draw water at its source.

b. " Abolish *classés*, and human nature will be able to better itself quickly, and be able to raise itself to a higher conception of life. Man will feel himself becoming a social individual, capable of developing fully, because he is in profound communion with all of society. " "

If these are not promises, they certainly have a resemblance to prophecies.

D. Discussion

1. The realism which Marx claims against Hegelian idealism, if considered apart from the materialism with which

« *Ibid.*, pp. 93'94-

« *Ibid.*, p. 75.

•• *Ibid.*, p. 88.

41 H. Wallon, *L'Individu et la Société* (Paris : Bureau d'Éditions, n.d.).

he confuses it, gives Marxism an air of good solid common sense. Unfortunately, however, the reign of common sense is only too brief.

Communism, in reaction to the extreme idealism of Hegel, accepts an external and material world whose essence and existence do not depend on human thought. Man is a body¹ linked to a mind, which influences and conditions all human life. A material productivity and a sociability flow from it, and their importance can not be ignored in the development of human beings. The Marxian criticism of capitalism is founded on the incontestable bases of man's subordination to nature and to the economic and social conditions of production. Man cannot fully become man, if material conditions, instead of helping him, paralyze his development.

However, we must insist that there is a morality of work, of property, of society, of the state, based on the hylomorphic structure of man, which is as realistic as Marxism, because it admits the dependence of man on matter. It is even more realistic than Marxism in that it recognizes in man a spiritual direction, and the attraction of an eternal life. Marxism sees nothing but the temporal and the material.

2. Nevertheless, it seems that *the spiritual* plays an indispensable role in Marxism :

" Communism, being an achieved naturalism, coincides with humanism.... It solves the mystery of history, and it knows that it does, " writes *Marx*. ⁴⁴

a. The human ideal. Actually, all Marxism, whatever its formulas say of it, contains an *idea* of man which serves as a criterion of value for appreciating the stages of history, for judging its meaning and for foreseeing its development. " How can one speak of alienation, i.e., of the dehumanization of man, except by comparison with an idea of man which ought to be realized?

⁴⁴ This quotation taken from Marx appears in P. Bigo, *Marxisme et Humanisme*, p. 141.

⁴⁵ See G. Wetter, *Dialectical Materialism*, p. 27.

"This humanism is so essential to the Marxian political economy that it cannot be removed without destroying the whole framework of the economic doctrine." ** As a matter of fact :

1) It is not work which is glorified, but the growth of man through his work.

2) It is man who acquires through it his qualities as man : intelligence, will, society.

3) It is not the misery of work which is described, but that of man, who, instead of being ennobled by work, is lowered and degraded by it.

"It is not the adventure of production which interests Marx, nor the accumulation of material riches, it is the human adventure that is implied in it." w

b. The progress of history. Only Marxian humanism — by reason of its decided materialism — avoids speaking of the moral or religious dignity of man. This dignity is expressed in biological and sociological terms. From a first point of view, capitalism is an "inversion" : man is crushed by the economic world which, although produced by him, nevertheless dominates him; from a second point of view, "capitalism conceals a 'perversion' ... it is at the same time an abolition of the liberty and equality of men among themselves." M

One can see that, even if spiritual formulas are avoided, the thought expressed remains ultra-experimental and metaphysical. Sense experience will never reveal man as the subject of rights. How, then, is man to be viewed as alienated, if his product is not recognized as belonging to him before some law? Human history shows itself as a tissue of contradictions only to him who thinks in a logical sequence, who has a sense of direction, who possesses a finality. "By themselves, facts are not contradictory. They simply exist, and that is all." "

This is true of alienation and of the prediction of the future, which is an essential vision for communism. "For the pure

M *Ibid.*, p. 27.

" P. Bigo, *Marxisme et Humanisme*, p. 135.

** G. Wetter, *Dialectical Materialism*, pp. 35-37.

P. Bigo, *Marxisme et Humanisme*, p. 139.

empiricist, history reveals no meaning, only successions.... The pure scientist acts with reserve. Marx does not hesitate. He clearly states that history is in a progressive march to a final objective." M How does he know this? " He simply affirms that there is a certain dignity in which history itself tends to establish man." 40 Definitely, this is an optimistic view, since it supposes that the new man will be very superior to the alienated man.

However, without any idea of human morality and spirituality, all the superiority of man over nature would be abolished, and Marxism would be destroyed. If it lives, it is by its unavowed and even rejected spiritualism. This is even an absolute spiritualism, to which Marx refers, when, after rejecting the existence of God, he supplants Him with a new god, humanity of the future, which will be the most excellent being. This is the supreme value to which the individual must subordinate himself, if he does not wish to be annihilated himself. " For its service, he liberates the most potent energy that exists, that of adoration."

The Marxian humanism, making man arise completely from matter, also elevates him to the summit of history, and places him at such a point in that which is real, that nothing is beyond him. Is this not making man the absolute?

c. Man, the end in himself. We can say with all sincerity, " What a poor absolute ! " for materialism explicitly and obstinately destroys that possibility.

1) To pose man as the absolute, as sufficient unto himself, is to offer the atheist as an ideal, a man who cannot be completed, a failure. Actually, reality contradicts the fundamental Marxian claim that religion alienates man by preventing him from being himself. God is the supreme end to which every human consciousness tends, and to fail to attain Him is to lose all in losing oneself.

2) It is only the future which would complete man. The man of the past and the present man would be only rough

" *Ibid.*, p. 139.

•• *Ibid.*, p. 139.

•° *Ibid.*, p. 142.

outlines. "The communist society will inaugurate the truly human period, in which, dominating his destiny, man will finally attempt to solve his specifically human problems, the problems of happiness, love and death. Man will be liberated from the conditions which make these problems insoluble." ⁴¹ Even for this far-off future, then, there remains only possibility.

3) What men would then have fulfillment? None of those who died before the suppression of class distinction would be in a position of understanding his own life. He would not even know that he was used as fertilizer for the flowering of future humanity, to use the expression of one of Dostoevsky's characters.

And the privileged ones in this Golden Age? If they are happy, it will be only at the cost of the renunciation of their personality, because of their integration into the bosom of collective humanity. Marxism denounces every personalist conception as mystification. "The existential center is... no longer personality, but collectivity." ⁿ

Will the man of the future be more personal? "There is no such thing in the Marxian concept. The individual must remain entirely stripped of protections before the collectivity. Final communism is not a community regime, it is an interiorized collectivism," wherein the individual agrees to be no longer reckoned as a person.⁶³

4) Finally, what probability is there of realizing this final communism? It would appear to be nil for two reasons : w

a) The final society is supposed to unite all individuals in an immediate way, but how is an individual capable of feeling himself identified with all humanity, capable of knowing it and loving it?

b) Such a society supposes a psychological transformation so profound that the history of man would say to us that it is

⁴¹ R. Vancourt, *Marxisme et Pensée Chrétienne* (Paris : Bloud et Gay, 1948), p. 93 (note): H. Lefebvre, *Le Matérialisme Dialectique*, p. 148.

⁴² E. Baas, *Introduction Critique au Marxisme*, p. 129.

⁴³ P. Bico, *Marxisme et Humanisme*, p. 157.

⁴⁴ *Ibid.*, pp. 157-160.

impossible. Without any doubt, men have succeeded in living a life completely in common, but their groups were freely formed, and they have always been rare. That all of humanity freely accept such a manner of life can only be a hoped-for Utopia. This total collectivism could be produced only by force, and then man would fall once more into the state of alienation....

d. The loss of the person. Thus Marxism professes its historical dialectic only by virtue of an implicit spiritualism; but it destroys it by the materialistic play of that dialectic. It is, undoubtedly, the presence of that spiritualism in it, which makes it attractive to both the elite and the masses. Is not the sense of the dignity of man innate in every consciousness?

It is most regrettable that spirit remains carefully masked in Marxism, and that, in the end, it is employed to effect its own destruction. This may be to the profit of humanism, but a humanism which destroys human personality and all true liberty.⁸⁸

To finish, Marxism "foresees a leap from the realm of necessity into that of liberty but, even supposing this prevision to have a basis, and ignoring the innumerable and definitively alienated generations which have disappeared, what, in the final stage, is this liberated man? "It is not the individual man, it is the collective man who enjoys this liberation." ⁸⁸ The person remains alienated, lost forever.

Recourse to any personal survival is definitely and absolutely excluded. Marx did not have to invent the denial of the soul's immortality. His master, Hegel, idealist though he was, accepts consciousness only in opposition to nature. Death suppresses that relation with nature, and by that fact, wipes out consciousness. ^{87••}

* N. Berdyaev, *Le Communisme et les Chrétiens*, pp. 178 ff.

•• *Ibid.*, p. 193.

* R. Vancourt, *Marxisme et Pensée Chrétienne*, pp. 52-97: see footnotes on page 74 and page 97. where Kojève's exposition of Hegel is quoted: "Dialectical anthropology allows no room for man's survival outside this natural world." Why? Because consciousness can constitute itself only as the negation of nature (its antithesis). Sartre says the same thing, when he states that the for-itself can constitute itself only as a nothing thrown on the in-itself.

3. *Materialism* is certainly the principal error of Marxism.

It falsifies its realistic basis, and perverts its humanist inspiration. It discourages the optimistic perspectives in it.

We must say this again. As dependent as man may be on matter, he has thought which does not find its source in matter,, and which makes him capable of dominating matter. He has liberty, by which he can choose, i.e., accept or refuse his material conditions, and consequently work to modify them in the direction of this choice. As dependent as he may be on others, he has a personal value which, far from putting him at the service of society, puts society at the service of his individual fulfillment. As dependent as man is on time and on the flow and counter-flow of events, he is not limited by a temporal and terrestrial horizon. His destiny' is not completely shut up in this life.

Finally, this threefold form of his incarnated spirituality has its foundation, wellspring, and fulfillment only in God who is the Creator, Provider and ultimate End of Humanity. It is Creation which makes man the king of the material world. It is Providence that endows him with his personal tendencies and, in particular, makes him capable of education by society. It is science and perfection, the life and happiness of God, which will fulfill human persons. This is not only the destiny of the late-comers to existence, to be enjoyed only for a time, but it is the destiny of all those who have the will to be good, a destiny that will endure for all eternity.

II. THE EXISTENTIALISM OF SARTRE

By reason of the phenomenological method, as opposed to the "scientific" or objective method professed by Marxism, the existentialist investigation seems to promise a more exact deciphering of human reality. J. P. Sartre attempts to realize this promise in the following organization of human existence :

- 1st Part. *Nothingness*, at the very interior of being-for-itself, and constituting it.
- 2nd Part. *Being-for-itself* is positively present to itself in a temporal situation, linked by knowledge to a transcendent in-itself.
- 3rd Part. *Being-for-the-other*, and, in particular, my body, is a fundamental structure of my being-for-myself.
- 4th Part. *Doing* and *liberty* are the very being of the for-itself, modifying the in-itself and tending to constitute itself as an in-itself-for-itself.

This general outline allows a description of the larger aspects of human consciousness and of the world which is correlative to it. Each type of human conduct, can reveal for us simultaneously man, the world and the relation which unites them..." (B. N., 4).⁶⁸

A. "Nothingness haunts being" (B. N., 16). Beginning with the Cogito as does Descartes, i.e., with doubt :

1. *Interrogation* supposes two objective possibilities, a yes and a no; two subjective possibilities, knowing and not knowing; and two relative possibilities, a present or an absent truth.

••The initials B.N. and the numbers which follow refer to the English translation of Sartre's *Being and Nothingness*.

"The permanent possibility of non-being, outside us and within us, conditions our questions about being" (*B. N.*, 5).

2. *Negative judgments* are directly in reference to an objective non-being. The break down of a machine, the destruction of a city, the absence of Peter for whom I am searching at this restaurant, are so many objective non-beings. Consciousness is necessary for their existence, but it recognizes in them something which is present in being. Non-being is actually based on being. "Non-being exists only on the surface of being" (*B. N.*, 16); "Nothingness can be nihilated only on the foundation of being." It can be given only as it "...lies coiled in the heart of being — like a worm" (*B. zV.*, 21).

Positive realities themselves "retain negation as the condition of the sharpness of their outlines" (*B.* 21), as distinguishing them from what they are not.⁴⁰

3. *The origin of nothingness* can not be the In-itself, because the latter is by definition fully positive, pure being. Therefore, "The being by which Nothingness comes to the world must be its own Nothingness" (*B.iV.*, 23). In fact, it is the questioner who "annihilates the thing questioned in relation to himself by placing it in a neutral state, between being and non-being, and... he annihilates himself in relation to the thing questioned by wrenching himself from being in order to be able to bring out of himself the possibility of a non-being"... "Man presents himself, at least in this instance, as a being who causes Nothingness to arise in the world, inasmuch as he himself is affected by non-being to this end" (*B. xV.*, 23-24).

4. *Liberty*. "Descartes following the Stoics has given a name to this possibility, which human reality has, to secrete a nothingness which isolates it — it is *liberty*" (*B. N.*, 24).

Briefly, then, discursive knowledge, liberty (they are completely one), is the source of nothingness. Man breaks away from the world, when he suspends his judgment. He engenders

"The clarity of an idea, obtained by definition and classification, comes not only from the dements it posits, but also and especially from that which it excludes: thus, as a whole, it signifies *being* and *non-being*."

nothingness by thinking and choosing NO, particularly in regard to his own past. "Consciousness continually experiences itself as the annihilation of its past being" (*B. N.*, 29).

5. *Anxiety* * springs from our awareness of liberty as liberty, from our recognition that liberty is the creator of values.

a. "But I am anxious precisely because all my conduct is always in the realm of the possible. This means that while constituting a totality of motives for pushing away that situation, I, at the same time, apprehend these motives as not sufficiently effective." ... "I am aware that nothing can compel me to adopt that conduct. ... Anxiety is precisely my consciousness of being my future in the mode of non-being" (*B.N.*, 31-32). There is likewise anxiety over the past. It is I who "make myself not to be the past of good resolutions which I am" (*B.N.*, p. 33). "This freedom, which reveals itself to us in anxiety, can be characterized by the existence of that nothing which insinuates itself between motives and act" (*B.N.*, 34).

b. Ethical anxiety is born of my original relation to values. Value does not itself *exist*: "On the contrary, it can be revealed only to an active freedom which makes it exist as value by the sole fact of recognizing it as such. It follows that my freedom is the unique foundation of values, and that nothing ... justifies me in adopting this or that particular value, this or that particular scale of values," and placing them by that fact in question, "I make my decision concerning them without justification and without excuse" (*B.N.*, 38-39).

6. *Bad faith* attempts to remedy anxiety which still constitutes my consciousness. It would like to annihilate anxiety, but it only succeeds in not thinking about it. "This nihilating power annihilates anxiety insofar as I flee it and annihilates itself insofar as I am anxious in order to flee it" (*B.N.*, 44). Thus is encountered "in the same consciousness, the unity of being and non-being — the being-in-order-not-to-be"

* The translator has preferred to translate *angoisse* by *anxiety*, instead of anguish as appears in H. Barnes' translation of *Being and Nothingness*.

(*B.N.*, 45). How is bad faith possible? One can find the answer by admitting "that human reality, in its most immediate being, in the inner-structure of the pre-reflective cogito, must be what it is not, and not be what it is" (*B.N.*, 67). "The first act of bad faith is to flee what it cannot flee, to flee what it is" (*B.N.*, 70).

B. Being-for-itself. In the cogito, Descartes saw the substance of the ego. Husserl ventures to see there only a phenomenon. Sartre says of this "That the being of consciousness does not coincide with itself in a full equivalence" (*B.N.*, 74). The opposite of in-itself, which is full of itself, consciousness "is a decompression of being. Impossible ... to define as coincidence with itself" (*B.N.*, 74).

In the first place, there is revealed to consciousness, over and above the in-itself which is the being of the phenomenon, nothingness which, produced by consciousness and constitutive of it as such, is distinct from the in-itself and is the negation of the in-itself. Liberty is thus consciousness itself, revealed in anxiety, and hiding itself in bad faith.

1. *The immediate structures* of the for-itself are : a. the presence to self; b. facticity; c. value; d. the possibles; e. ipseity.

a. Presence to self. "The law of being for the for-itself, as the ontological foundation of consciousness, is to be itself in the form of presence to itself." Presence to self indicates a duality, a negation. "The being of consciousness qua consciousness is to exist at a *distance from itself* as a presence to itself, and this empty distance which being carries in its being is Nothingness" (*B.N.*, 77-78).

b. The facticity of the for-itself is that it is; "It is insofar as there is in it something of which it is not the foundation — its presence to the world." Descartes stated the dependence of the ego by looking for the cause of the idea of the Perfect, which he found in the ego and which he explained by asserting the existence of God. Sartre explains it by beginning with the constitutive nothingness of the for-itself. This nothingness can

not be the foundation of the being of the for-itself, its in-itself. The being of the for-itself, not being able to be based on its liberty, is, therefore, a pure contingent fact. " This peppetually evanescent contingency of the in-itself which, without ever allowing itself to be apprehended, haunts the for-itself and reattaches it to being in-itself — this contingency is what we shall call the facticity of the for-itself " (*B.N.*, 79-83). I am, I am in such a situation, my role is real and not that of a player, and I have chosen no part of this. "... the for-itself is conscious of its facticity. It has the feeling of its complete gratuity. It apprehends itself as being there for nothing, as being '*de trop*' (*B.N.*, 84).

c. Value occurs in the world through the for-itself: " The being of the for-itself is value. "... " Value is the self insofar as the self haunts the heart of the for-itself as that for which the for-itself is " (*B.N.*, 93).

Actually the for-itself supposes a lack. What is missing gives it its meaning by totalizing it; the totality of the existent and of the missing is the *for* towards which the desire of an existent calls. What is this *for* of man? "... the self as being-in-itself is what human reality lacks.... It is for the for-itself as such that the for-itself lays claim to being-in-itself. ... It is the impossible synthesis of the for-itself and the in-itself. " This synthesis, hypostasized beyond the world, is called God.

Hence the origin of suffering and unhappy consciousness, because human reality " rises in being as perpetually haunted by a totality which it is without being able to be it, precisely because it could not attain the in-itself without losing itself as for-itself " (*B.N.*, 88-90).

Value is then characterized " as the meaning and the beyond all surpassing; as the absent in-itself which haunts being-in-itself, " insofar as it is founded on and is freedom, " as it makes itself be as having to be this being " (*B.N.*, 94).

The for-itself does not create values. In a sense it is these values and they are necessary and contingent as it is. Moral consciousness only forces the unveiling of them. Conscious or not, values are (*B.N.*, 95).

d. The possible " is what the for-itself lacks in order to be self. " It is not simply an idea. It is a real lack of being, which, as lack, is outside of being. ... The in-itself ... cannot have possibles. ... The possible is a new aspect of the annihilation of the in-itself into the for-itself (*B.N.*, 95-102).

a. The ipseity or personality is formed from two nihilating reflections : one grasps " the fact that the being exists for itself as a presence to itself, " the other, " the free necessity of being-down there — what one is in the form of lacking, " what one is as his possible (*B.N.*, 103-104).

But if the for-itself thus transcends itself in the direction of value and possibles, " it is in time that the for-itself is its own possibilities in the mode of * *not-being*, * it is in time that my possibilities appear on the horizon of the world, that they are made mine " (*B.N.*, 104-105). In what does this temporal character of the for-itself consist?

2. *Temporality*

a. Temporalized phenomena

My past reduces me to the in-itself. " Actually, the past, like Facticity, is the invulnerable contingency of the in-itself which I have to be without any possibility of not being it " (*B.N.*, 118).

The present is not the instant : " for the instant would be the moment when the present is. But the present is not, it makes itself present in the form of flight.... It is a flight outside of co-present being, from the being it was to the being it will be " (*B.N.*, 123).

My future is not an always present and impersonal representation. It is the fact of " being which makes itself exist as having its being outside itself in the future. " The future is that which I have to be in so far as I can not be it " (*B.N.*, 125). It is not. It makes itself possible by reason of liberty.

b. The being of time is succession and becoming.

Succession. Sartre asserts, against Hume and associationism, that succession of two states which would be in-itself is inconceivable, that the before-after relation can exist only as

a witness. What witness? It can not be a witness which transcends time, such as God is for Descartes, or as the transcendental ego is for Kant. Psychological duration would no longer be any more " than the confused perception of a logical and eternal order. " As Bergson has said, it is within duration that its unity lies. That which permits duration, according to Sartre, is conscious nihilization : " Indeed, it is only because the self in its being is there outside itself, that it can be before or after itself, that there can be in general any before and after. Temporality exists only as the intra-structure of a being which has to be its own being, " i.e., of the for-itself. ... " For-itself temporalizes itself by existing " (*B.N.*, 136).

" Conversely ... the for-itself can not be except in temporal form, the For-itself rising into being as the nihilation of the In-itself constitutes itself simultaneously in all the possible dimensions of annihilation. . . .reflection, transcendence, being-in-the-world and being-for-others. . . . Thus nothingness introduces quasi-multiplicity into the heart of being, " and thus temporality. These dimensions can not be separated from the for-itself : " temporality is the mode of being proper to being-for-itself " (*B.N.*, 136, 137, 142).

Becoming. Does it imply permanence (as Leibniz and Kant believed)? There must at least be a " permanent in the sense of the thing which changes. " This does not fulfill the definition of in-itself. An absolute permanence is not required, a link with the past is all that is demanded : either nothing changes or all changes, as the Gestalt theory has shown.

As to the mover in temporal becoming, there exists a problem only for those who open the problem of change in the in-itself, but " change belongs naturally to the for-itself inasmuch as the for-itself is spontaneity. " Indefinable spontaneity : to define it would be to congeal it into the in-itself. Spontaneity unceasingly evades itself. Here the for-itself is incapable of being achieved. It is a totality which is never totalized : " it is nothingness slipping into a totality as a detotalizing ferment, " never being able " to exist within the limits of an instant. There is never an instant at which we can assert that the for-itself *is*,

precisely because the for-itself never is, ' it is making itself (*B.N.*, 148, 149).

c. Reflection, the recovery of time, is still an annihilation which the for itself *has to be*. It is " a permanent possibility of the for-itself as an attempt to go back over being, " in the flight of self which is time. It " is recognition rather than knowledge. It implies as the original motivation of the recovery a pre-reflective comprehension of what it wishes to recover. " It supposes, briefly, a kind of previous, lived, unknown possession of his own time by each one. The solidity of the Cogito comes from the fact that it is not limited to the instant, but extends to the past and the future. '•

Reflection can be impure : it objectifies the for-itself, by making it an ego, a psyche, with only an ideal existence; but " this phantom world exists as a real situation of the for-itself, " interfering with my liberty (*B.N.*, 160-170).

3. *Transcendence*. Here Sartre takes up again the problem concerning relations with the in-itself. He wants to get beyond realism which supposes an action of the in-itself on consciousness, and idealism, which supposes the in-itself constructed by consciousness. The two systems make of the in-itself and the for-itself two isolated substances. Isolated, they are only abstractions : " it is in the for-itself alone that we must look for the key to that relation to being which we call ... knowledge " (*B.N.*, 172).

a. Knowledge is always intuition : not a presence of the thing to consciousness, but " the presence of consciousness to the thing. " Presence is essential to consciousness : " In fact it is by means of that of which it is conscious, that consciousness distinguishes itself in its own eyes and that it can be self-consciousness. " " The thing is ... that which is present to consciousness as *not being* consciousness. " Presence which is only a way of existing : " knowledge appears then as a mode of

'• We can see, in this pre-reflective Cogito, something which is equivalent to Bergsonian " intuition " or that " habitual " knowledge which the soul has of itself, which, St. Thomas asserts, is the foundation of the knowledge of the soul through its acts.

being. ... It is the very being *of* the for-itself insofar as this is presence to — i.e., insofar as the for-itself has to be its being by making itself not to be a certain being which is present. ”

Here, there is a question of internal negation, i.e., of “ a relation between two beings which is such that the one which is denied to the other qualifies the other at the heart of its essence — by absence this relation is possible only in the for-itself. Transcendence is “ that inner and realizing negation which reveals the in-itself while determining the being of the for-itself ” (*B.N.*, 172-180).

b. Consequences

1) To *idealism* we concede “ the identity of the being of the for-itself with that of knowledge but this identity ” does not come from the fact that knowledge is the measure of being it comes “ from the fact that in its being it is a relation to being. ”

2) To *realism* we grant “ that it is being which is present to consciousness in knowledge, and that the for-itself adds *nothing* to the In-itself, except the very fact that *there is* an In-itself. ”

3) But we concede nothing to either *skepticism* or *relativism*, for “ knowledge puts us in the presence of the absolute, and there is a truth of knowledge. But this truth, although releasing to us nothing more and nothing less than the absolute, remains strictly human ” (*B.N.*, 21-218).

C. Being-for-others is “ another mode of existence as fundamental as the being for-itself. ” It is discovered, for example, in shame, which is “ in its primary structure *shame before somebody* ”; “ I am ashamed of myself as I appear to others. ”

1. *The existence of others.* Anxious to avoid a solipsism, Sartre attempts to set up a basis for the communication between consciousnesses. Heidegger offers him the intuition of a *team*, of a *we*, of a communal existence, a “ Mit-sein, ” which becomes conscious through events and the pursued end, up to “ the abrupt revelation of my being-unto-death, ” which makes me stand alone. Sartre sees there very clearly “ a being which implies the

being of another in its own very being," but he finds that Heidegger's solution is not basic enough. The opposition to others is more evident than co-existence, and the "mit-sein" tends to suppress the other by confusing it with the ego. "The Other must appear to the *Cogito* as not being me," but linked to me by an internal negation (*B.N.*, 223-252).

Now the other is "*that which looks at me.*" "To perceive is to look at, and to apprehend a look ... is to be conscious of being looked at." Thus I know that I have a body, that I am seen, and consequenti} I see myself because someone sees me.

"The person is present to consciousness insofar as the person is an object for the Other. This means that all of a sudden I am conscious of myself as escaping myself ... in that I have my foundation outside of myself. I am for myself only as I am a pure reference to the Other."

"The alienation of myself, which is the act of being looked at, involves the alienation of the world which I organize." 71 "With the Other's look the 'situation' escapes me. I am an object, which is localized and temporalized. Through the Other's look I live myself as fixed in the midst of the world, as being in danger, as being something irremediable" (*B.N.*, 258-268).

Thus I experience the other as a free subject.

What then is the fundamental relation between the ego and the other? It is still an internal negation, but reciprocal this time: "The being which consciousness has to not be (the Other) is defined as a being which has not to be this consciousness" (*B.N.*, 284). "Shame, fear and pride are my original reactions; they are only various ways by which I recognize the Other as a subject beyond reach," and constitute it as object. But correlatively, "they include within them a comprehension of my selfness which can and must serve as my motivation for constituting the Other as object. ..." "...my relations with the Other-as-object are essentially made up of ruses designed to make him remain an object. However, one look on the part of the Other is sufficient to make all these schemes collapse and

⁷¹ P. Foulquié, *L'Existentialisme*, p. 77.

to make me experience once more the transfiguration of the Other " into subject, degrading me to the level of an object (*B.N.*, 291-297).

In short, I experience the other as an existing thing and subject, by sensing myself as the object of his look. I react against this alienation of myself which profits him, by apprehending the other, in my turn, as object. That, which is revealed to me by this, is my body and his.

2. *The body* " is completely psychic " (*B.N.*, 305); therefore, the problem of the union of the soul and body need not be posed. " Being-for-itself must be wholly body and it must be wholly conscious; it can not be united with a body. Similarly, being-for-others is wholly body; there are no * psychic phenomena ' there to be united to the body. There is nothing behind the body " (*B.N.*, 305).

a. The body as being-for-itself is described as taking its origin " from our first relation to the in-itself of our being-in-the-world. " This relation is exclusively mine. I certainly have not chosen it, but it is imposed on me, and it is a fact : " we would define the body as the *contingent* form which is assumed by the necessity of my contingency. ... It is the fact that the for-itself is not its own foundation. It is a part of the situation of the for-itself " (*B.N.*, 306-309). " The soul *is* the body inasmuch as the for-itself *is* its own individuation " (*B.N.*, 310).

The body is mine, inasmuch as it is the for-itself's viewpoint of the world : " it is the total center of reference which things indicate, " sensing and acting at the same time. It is the key to all the instruments which constitute the world, the key which gives them their meaning, but remains unknown : " present in every action although invisible ..., it is lived and not known. " It is " perpetually the *surpassed* ... that beyond, which **I am** " (*B.N.*, 320-326), the starting point as well as the point of view. In short, " Birth, the past, contingency, the necessity of a point of view, the factual condition for all possible action on the world — such is the body, such it is for me. " " But this inapprehensible body is precisely the necessity *that there be a choice*, that I do not exist all at once " (*B.N.*, 327-323).

What is it then *for inc*?

"The relation between the body-as-point-of-view and things is an *objective* relation, and the relation of consciousness to the body is an *existential* relation." For reflection, "my body is the conscious structure of my consciousness," but in existence, it is "that which it (my consciousness) surmounts and annihilates by making itself consciousness ...; the body is the neglected, the passed by in silence, and yet the body is what this consciousness is; it is not even anything except body. The rest is nothingness and silence" (*B.N.*, 329-330).

Thus, in physical pain, before reflection, the pain is the body. It is reflection which makes them distinct. It is affectivity, in general, which reveals the psychic body as "a pure apprehension of the self as a factual existence. This perpetual apprehension on the part of my for-itself of an insipid *taste* which I can not place, which accompanies me even in my efforts to get away from it, and which is my taste — this is what we have described elsewhere under the name of Nausea" (*B.N.*, 335-338).

b. The body-for-others is, first of all, "the facticity of the other's body as an instrument, and as a synthesis of sense organs as it is revealed to my facticity" (*B.N.*, 342). It is a body in "situation," i.e., linked to the world by meaningful relations, and it is flesh or life as a summation of all its organs. "Thus since the body is the facticity of transcended-transcendence, it is always the body-which-points-beyond-itself; it is at once in space (it is the situation) and in time (it is freedom-as-object)" (*B.N.*, 351).

c. My body-for-others, i.e., "I exist for myself as a body known by the Other" (*B.N.*, 351). Here is a facticity that can be joined to so many others: "I apprehend my own facticity ... in its flight towards a being-in-the-midst-of-the-world. ... My body is there not only as the point of view that I am, but again as a point of view on which are actually brought to bear the points of view which I could never take; my body escapes me on every side" (*BaV.*, 352).

I have the experience of being alienated, dispossessed of myself, in timidity, in the so-called objective knowledge of the

body : thus, the perception of my body is placed chronologically after the perception of the body of the other (*B.N.*, 358).

3. *The concrete relations with the Other* are not reduced to a being-with (the "mit-sein" of Heidegger), but to a conflict, inspired by egoism, aiming at the recovery of my being, which the Other degrades by turning the for-itself into an in-itself by his look (which makes of me a body-object), in order to bring me into being as my "God."

This conflict has two forms : the first would wish to recover myself as *in-itself*. Therefore, I make myself object for the Other in order to fascinate him and capture him in his liberty by submitting myself to him. Such attempts are seen in love, language and masochism. The second would wish to recover myself as *for-itself*, by making of the Other my thing. Such attempts are seen in sexual desire, sadism and hate.

These two offensives fail and each turns into the other, because the first makes me lose myself as a for-itself, and the second delivers me over to conquering the Other only in the state of a pure in-itself, when it had aimed at capturing him in his liberty as a for-itself.^{7a}

D. Having, doing and being. Sartre begins here "the study of action in general ('the for-itself is being which is defined by action') and the essential relations of doing, of being and of having." "Is the supreme value of human activity a doing or a being and what is to become of having?" (*B.N.*, 431).

1. *Being and doing : freedom.*

a. *Freedom, the first condition of action.* "To act is to modify the shape of the world," in an *intentional* manner, however, and not mechanically. Intention supposes a lack, a possible, a desirable : "No factual state ... is capable by itself of motivating any act whatsoever ..., nor can it determine consciousness to apprehend it as a *negatite*, or as a lack." "It is

⁷ See R. Verneaux, *Leçons sur l'Existentialisme*, pp. 129-136; E. Mouniek, *Introduction aux Existentialismes*, pp. 93-99; P. Foulquié, *L'Existentialisme*, pp. 77-81.

the act which decides its ends and motives and the act is the expression of freedom " (*B.N.*, 433-438).

is freedom? " It is not a quality added to my nature or a property thereof. It is very exactly the stuff of my being " (*B.N.*, 439). " To say that the for-itself has to be what it is ..., to say that in its existence precedes and conditions essence ... all this is to say one and the same thing : to be aware that man is free " (*B.N.*, 439).

This is a *jact* which is *absolute*. " I am condemned to be free. This means that no limits to my freedom can be found except freedom itself, or, if you prefer, that we are not free to cease being free " (*B.N.*, 439).

"...for human reality to be is to choose oneself; nothing comes to it either from the outside or from within which it can receive or accept. Without any help whatsoever, it is entirely abandoned to the intolerable necessity of making itself be — down to the slightest detail. Thus freedom is not a being, it is the very being of man — i.e., his nothingness of being. ... Man can not be sometimes slave and sometimes free; he is wholly and forever free, or he is not free at all " (*B.N.*, 439-441).

Everywhere in man : " All my modes of being manifest freedom equally, since they are all ways of being my own nothingness " (*B.N.*, 445); Sartre, in particular, asserts the freedom of the passions, against Descartes and the Stoics (*B.N.*, 441).

It is *constitutive* of man : " it is a freedom which is beyond motives, means and ends. ... When I deliberate, the chips are down. " If I choose to deliberate, it is to become aware of my choice : " when the will intervenes the decision is taken, and it has no other value than that of making an announcement " (*B.N.*, 450-451).

Its initial project is translated into each particular act. This project concerns " my being in the world insofar as this being is choice " 457). " A gesture refers to a *Weltanschauung* and we sense it " (*B.N.*, 457).

" The fundamental act of freedom ... which gives meaning to the particular action ..., constantly renewed, is not distinct

from my being; it is a choice of myself in the world, and by the same token, a discovery of the world ". ... " The profound choice ... is simply one with the consciousness which we have of ourselves ... Choice and consciousness are one and the same thing " (*B.N.*, 462). Choice is anterior to all deliberation, choice is that which deliberation and decision only express.

Its expression is not of the conceptual order: this initial project implies a solution to the problem of being, but " we are this solution. We make it exist by means of our very commitment, and therefore we shall be able to apprehend it only by living it. " It is expressed " by the twofold feeling of anxiety and responsibility anxiety to feel our modifiable and feeble choice, unable to be justified by the past and committing us to the future (*B.N.*, 464). * To choose ourselves is to annihilate ourselves; that is, to cause a future to come and make known to us what we are by conferring a meaning on our past " (*B.N.*, 465).

Freedom and essence. Here there is a difference with Leibniz, for whom Adam's free choice constitutes a part of the essence of Adam, such as God has created it, " for us, indeed, the problem of freedom is placed on the level of Adam's choice of himself — that is, on the determination of essence by existence " (*B.N.*, 469).

Freedom and datum. "If consciousness exists in terms of the given, this does not mean that the given conditions consciousness; consciousness is a pure and simple negation of the given, and it exists as the disengagement from a certain existing given, and as an engagement towards a certain not yet existing end. ... We shall never apprehend ourselves except as a choice in the making. But freedom is simply the fact that this choice is always unconditioned " (*B.N.*, 478-479).

The absurdity of choice. " This choice is absurd, not because it is without reason, but because there never has been any possibility of not choosing oneself. " Not absurd as would be a phenomenon unrelated to others through causes, but " in tins sense, that the choice is that by which all foundations and all reasons come into being, that by which the very notion of the absurd receives a meaning " (*B.N.*, 479).

But " freedom ... is the perpetual escape from contingency; it is the interiorization, the annihilation and the subjectivizing of contingency, which thus modified, passes wholly into the gratuity of choice " (*B.N.*, 479).

As to particular choices, which are contingent in themselves, unforeseeable and absurd, they are understood as integrated into the total project.

b. *Freedom and facticity*: the situation. To choose is not yet realization: the résistants to the free project, far from destroying it, are useful to it, and it is because of the free project that these resistances arise.

" The resistance which freedom reveals in the existent, far from being a danger to freedom, results only in enabling it to arise as freedom. There can be a free-for-itself only as engaged in a resisting world " (*B.N.*, 483).

What are the sources of this resistance?

1) From the facticity of freedom: " we are a freedom which chooses, but we do not choose to be free. We are condemned to freedom. "

2) From the contingency of the world looked at from the point of view of the body (*B.N.*, 485-486). *The situation* is " the contingency of freedom in the plenum of being in the world inasmuch as this datum ... is revealed to this freedom only as already illuminated by the end which freedom chooses — "

" Situation and motivation are really one ... there is freedom only in a situation, and there is a situation only through freedom " (*B.N.*, 487-489).

" The facticity of freedom is the given which has to be, and which it illuminates by its project " (*B.N.*, 489). This given, this situation, has several forms:

a) *If-then* -place in the world, place of birth, etc.

b) *My past*. Freedom " has to be its own past, and this past is irremediable, " although it is always in a state of reprieve and transformable by the future and by history (*B.N.*, 496).

c) *My environment*, i.e., " the instrumental things which surround me, including their particular coefficients of adversity and utility " 504).

d) *My fellowman.*

e) *My death.*

c. *Freedom and responsibility.* " The responsibility of the for-itself is overwhelming, since the for-itself is the one by whom it happens that there is a world, since he is also the one who makes himself to be " (*B.N.*, 553).

Nevertheless there is no reason to complain. Nothing foreign to me has decided what will happen. " If I am mobilized in a war, this war is my war. It is in my image and I deserve it. ... For lack of getting out of it, I have chosen it. "

Still more : " To live this war is to choose myself through it and to choose it through my choice of myself. "

But " I am responsible for everything ... except for my very responsibility, for I am not the foundation of my being " (*B.N.*, 554-555). I am only the foundation of the for-itself of my being.

Nevertheless, " in a certain sense I choose being bom, " I take an attitude towards my birth and my parents. Thus, " I am the being which is in such a way that in its being its being is in question " (*B.V.*, 556).

Therefore, since all is an occasion or opportunity for my project, " the responsibility of the for-itself extends to the entire world as a peopled world. "

" It is precisely thus that the for-itself apprehends itself in anxiety, that is, as a being which is neither the foundation of its own being, nor of the Other's being, nor of the in-itselfs which form the world, but a being which is compelled to decide the meaning of being — within it and everywhere outside of it " (*B.N.*, 556). The attitude which results is neither remorse, nor regret, nor excuse. It is too often bad faith, but the authentic attitude is that of " a freedom which reveals itself perfectly, and whose being resides in this very revelation " (*B.N.*, 556).

2. *Doing and having.*

a. *Existential psychoanalysis* is the " method destined to bring to light, in a strictly objective form, the subjective choice by which each living person makes himself a person, that is,

makes known to himself what he is. " It awaits its Freud, and it must analyze not only dreams and failures, but also, and especially, the thoughts of wakefulness and successfully executed acts as well (*B.N.*, 575). Lacking a Freud, Sartre attempts to mark out the fundamental human project. We can see in his effort, although he disavows it, a search for the essence of man.

" The original project of a for-itself can aim only at its being " (it can be neither death, nor life, nor any particular characteristic) : " Fundamentally man is the *desire to be* the original project ... is then, *the project of being*. ... The being which the for-itself lacks is the in-itself " (*B.N.*, 564-565).

" In addition, the for-itself, being negation of the in-itself, could not desire the pure and simple return to the in-itself. ... It is as consciousness that it wishes to have the impermeability and infinite density of the in-itself. ... This is why the possible is projected in general as what the for-itself lacks in order to become in-itself-for-itself, that is, the ideal of a consciousness which would be the foundation of its own being-in-itself by the pure consciousness which it would have of itself. It is this ideal which can be called God. ... To be man means to reach towards being God. ... Man is fundamentally the desire to be God " (*B.N.*, 566).

Would this be the essence of man? No, Sartre answers, for if the desire has this meaning of a project to become God, the desire is not constituted by this meaning, but always by a particularized intention. " Freedom can arise only as being which makes itself a desire of being : that is, as the project for-itself of being in-itself-for-itself. ... The structure under consideration can be called the *truth* of freedom : that is, it is the human meaning of freedom " (*B.N.*, 567-568).

b. *Possession* : having. " The desire to have aims at the for-itself on, in, and through the world " (*B.N.*, 598). Inseparable from the desire of being, it aims at the same goal, but it interposes the world between the for-itself and its being in order to be. " Every for-itself is a free choice ... : it is a choice of being, either directly or by the appropriation of the world. ... Thus my freedom is a choice of being God, and all my acts, all my

projects translate this choice and reflect it in a thousand and one ways " (ways of being and ways of having) (*B.N.*, 599).

Doing is a means of having. So is knowing and even gambling, although the latter does not readily appear so. Gambling is at least the desire to possess.

Having is an internal relation between the possessor and the possessed, wherein only the possessed can be substance, since the possessor is not sufficient : " the internal relation of the for-itself to the in-itself, which is ownership, derives its origin from the insufficiency of being in the for-itself " (*B.N.*, 588). The desire of having is reduced, then, to the desire of being, as has already been done with doing.

But notice here the revenge of the for-itself : " the possessor is the *raison d'être* of the possessed object, " he is the creator of it. However, " that which I create ... is me. The tragedy of the absolute Creator, if he existed, would be the impossibility of getting out of himself, for whatever he created could be only himself. ... The panorama is myself dilated to the horizon, for it exists only through me and for me. ... Creation is an evanescent concept which can exist only through its movement. ... As the object rises up in my world, it must be simultaneously wholly me and wholly independent of me. ... Thus the relation of continuous creation encloses within it as its implicit contradiction the absolute, in-itself independence of the objects created " (*B.N.*, 590-591).

Therefore, " we see that appropriation is nothing save the symbol of ideal of the for-itself or value. The dyad for-itself possessing and in-itself possessed is the same as that being which is, in order to possess itself, and whose possession is in its *ora* creation — God " (*B.N.*, 592). However, this relation is completely ideal and symbolic.

" The relation of possession appears to us clearly : to possess is to wish to possess the world across a particular object, " and " to-be-in-the-world is to form the project of possessing the world; that is, to apprehend the total world as that which is lacking to the for-itself in order that it may become in-itself-for-itself " (*B.N.*, 597).

c. *Quality as a revelation of being.* The meaning which man gives to things is discovered in the qualities which man knows or remarks, whether he likes them or detests them.

"Take for example that particular quality which we call * slimy.' Certainly for the European adult it signifies a host of *human and moral* characteristics which can easily be reduced to relations of being " (*B.N.*, 604). The study of qualities would allow the beginning of existential psychoanalysis through the phenomenological method. "There is no irreducible taste or inclination. They all represent a certain appropriative choice of being. "

"Ontology abandons us here; it has merely enabled us to determine the ultimate ends of human reality, its fundamental possibilities, and the value which haunts it. Each human reality is at the same time a direct project to metamorphose its own for-itself into an in-itself-for-itself, and a project of the appropriation of the world as a totality of being-in-itself, in the form of a fundamental quality. Every human reality is a passion in that it projects losing itself so as to found being, and by the same stroke to constitute the In-itself which escapes contingency by being its own foundation, the *Ens causa sui*, which religions call God. Thus the passion of man is the reverse of that of Christ, for man loses himself as man in order that God may be born. The idea of God, however, is contradictory and we lose ourselves in vain. Man is a useless passion " (*B.N.*, 615).

E. Sartre's humanism can thus be summed up as follows :

1. It is an *atheism* and even an *antitheism*. God is only an idea, a contradictory idea, which, nevertheless, serves as a magnetic pole for liberty. To postulate a creating God would be to destroy freedom, i.e., man. Belief in God is a channel of bad faith.

2. *Existence precedes essence*, in man, and in him alone. To exist is to be free, to choose oneself to be such or such. Man would not be man if his essence preceded him in the exemplary idea of God.

3. *Freedom* is without limit, without condition. It is creative of the values which it reveals by projecting itself towards

the possibles, towards that which it lacks, by the very fact that in choosing itself it chooses that which is not yet in being.

Freedom is that fundamental project of making the in-itself-for-itself. It is freedom that gives its meaning to every particular choice. This project is a contradiction.

Freedom and responsibility are complete. They concern me, others and the world.

However, to be free is a fact which I am not free to annul, of which I am not the foundation. I am condemned to be free.

Anxiety arises from my freedom which is simultaneously complete and contingent. I could avoid it only by ceasing to be man through bad faith, by falling back toward reassuring behavior, such as might be supplied by moral rules and religious hopes

4. *Society* is essentially conflict and irreducible antagonism.

5. *The absurd* can not be eliminated from man. It is found everywhere that freedom cannot be fundamental, in the given in-itself, in birth, in the *very* fact that I am a freedom, and in my death.

6. *Nothingness* is the great originality of consciousness or of freedom (they are both one). It is the negation in act which constitutes the for-itself in all its attitudes, and especially in its freedom which temporalizes itself, and in its opposition to the in-itself and to others. "

F. Observations. The question posed by being and nothingness is not : "What is man? " " Our present investigation does not aim at constituting an anthropology " (*B.N.*, 282). Yet Sartre asserts that existentialism is a humanism and that it has its own idea of man. We can say that it is the privileged center from which he studies the relation of being to nothingness. To subtle psychological descriptions, he joins dangerous omissions and erroneous negations, which are attributable to the phenomenological method and to a certain idea of man which, perhaps, is more representative of the fundamental individual project of Sartre than it is of man in general.

1. *Does existence create essence?* My freedom does not create me as man, nor even as this man. It takes this man here and transforms him. Could I, by chance, plant myself either as God or as man in the thirteenth century? My freedom takes its place from my "situation," at least in part, and gives it a meaning. The war of 1939 enters into my essence, through my freedom, in a new way, certainly; but it is already there without my choice, and no matter what anyone says, it conditions my choice. ⁷¹

"I choose myself — not in my being, but in my manner of being" (*B.N.*, 546) is a formula which is already excessive. It should rather be expressed by the phrasing "in certain of my manners of being." But then, to say that existence creates essence would appear as an error obscuring a truth and would scarcely be a help to determinists who would deny recognizing it.

2. *My essence?* Sartre *denies exemplarism*. My essence is not the form of my existence, first present in the divine idea, according to which I am molded little by little, and which is forced as a law or duty on my freedom. The reason? God is not, and such an essence would exclude all freedom from me.

Sartre denies that I am a substance. How could I be one, since, "nothingness is this whole of being, this fall of the in-itself toward the self, the fall by which the for-itself is constituted" (*B.N.*, 79)? Would at least the *in-itself which is interior* to consciousness be a substance? No, "Facticity is not then a substance of which the for-itself would be the attribute and which produce thought without exhausting itself in that very production. It simply resides in the for-itself as a memory of being, as its unjustifiable presence in the world" (*B.N.*, 84).

"Human reality is the pure effort to become God without there being any given substratum for that effort, without there being anything which so endeavors. Desire expresses this endeavor" (*B.N.*, 576).

"For the for-itself, to be, is to nihilate the in-itself which it is. Under these conditions freedom can be nothing other than this annihilation" (*B.N.*, 439).

3. *My freedom*, then, is what I am. But what is it? Where is it?

It is not in deliberation, nor in decision, nor in action. It "is beyond causes, motives and ends. ... When I deliberate, the chips are down ..., and the choice of deliberation (I choose to deliberate by an internal spontaneity) is organized with the ensemble motives-causes, and end by a free spontaneity. When the will intervenes, the decision has already been taken, and it has no other value than that of making an announcement " (*B.N.*, 450-451).

That which constitutes the voluntary is the reflection manifesting movers and motives, whereas spontaneity lives them and chooses without knowing them. This spontaneity is the most profound freedom : "...the will is not a privileged manifestation of freedom ..., it is a psychic event of a peculiar structure which is constituted on the same plane as other psychic events, and which is supported, neither more nor less, by an original, ontological freedom " (*B.N.*, 452).

My freedom is choice : " The fundamental act of freedom is discovered ... ; this constantly renewed act is not distinct from my being; it is choice of myself in the world ".... " It is simply one with the consciousness we have of ourselves," since consciousness is " selection " (*B.N.*, 461-462).

And here we are brought back to a pure unfolding of historical events. " To choose ourselves is to annihilate ourselves; that is, to cause a future to come and make known to us what we are by conferring a meaning on our past " (*B.N.*, 465). We can clearly see here the affirmation of an internal sequence between the moments of time, a sequence wherein the future determines the past. However, we no longer see any indication of freedom.

The shell, however, is still kept. Only one of the possibles will happen which will confer a meaning on the series which has flowed by and which up to now is undetermined. This possible will annihilate the others, and, by reason of that, the other modes which the for-itself could have become. The shell of freedom is there; the passage from the undetermined to the determined,

the choice among the possibles. But where would be its strength, since no substantial principle governs the choice? Since the choice is as free as if it had never been reflected upon and willed? Since to choose is simply to annihilate a particular in-itself which was able to appear in time?

So well does this radical affirmation of complete, unlimited and unconditioned freedom do its job, that it emerges only as a negation of all authentic freedom.

4. *The consequences of such a freedom collapse with it.*

a. *Anxiety* no longer has any basis. We can understand that a believer might be filled with anxiety at his sins in the sight of the Holy Trinity, that an honest man might be filled with dismay at the sight of so many objective moral values so often violated by himself and his fellow men, that a man conscious of reflective choice and consent could be anxious about the possible unfortunate consequences of his acts, and that an attention fixed on the eternal significance of free acts might be condensed into extreme anguish.

But, according to Sartre, nothing subsists. God is absent. Values come into the world through myself alone. My choice is reduced to a spontaneous selection among possibles. Above all, I am beset from every side by death which destroys my for-itself. What is there to fear? This nothingness which we are? This in-itself which is inactive and indifferent?

Truly, is there a better prospect for avoiding anxiety than Sartre's system? Or rather, is not the presence of anxiety the best proof that his system is false?

b. *Values.* Their solidity is that of essences. Actually, value appears either in an act or in an event undergone, which is compared to a fully realized essence. Thus, error, health, can only be thought of in reference to an optimum of knowing or living. The possibility of the presence or the absence of a useful part of the total perfection of a being, i.e., of its essence, suffices to make the value appear. A fortiori freedom would be sufficient here: in this sense it creates value, but it creates it only in reference to the essence of a free being, defined elsewhere.

Suppress the essence, leaving only freedom (an impossible hypothesis), there remains only a sequence of events without value.

If man is nothing other than what he makes himself, if he is not already in some way (by his essence) that which he is not yet in a realized way (by his liberty or otherwise), that which he *must be*, there is no longer a rule of value, nor an objective moral law. We can understand that, with such an ontology, "we can not derive imperatives from ontology's indications" (*B.N.*, 625). "Ontology and existential psychoanalysis ... must reveal to the moral agent that he is the *being by whom values exist*. ... His freedom ... will reveal itself in anxiety as the unique source of value" (*B.N.*, 627).

We can understand why Sartre, in order to finish, poses the question: "Will freedom by the very fact that it apprehends itself as a freedom in relation to itself, be able to put an end to the reign of value? In particular is it possible for freedom to take itself for a value as the source of all value, or must it necessarily be defined in relation to a transcendent value which haunts it?" (*B.N.*, 627). The bent of the system would lead Sartre towards the affirmation of the first hypothesis: "Nothing could make value exist, if there was not this liberty which at the same stroke makes me exist myself" (*B.N.*, 84-95).

Nevertheless, he is sometimes aware of the excess in such formulas and compensates for them by others: "Value ... is not at all *-posited* by the for-itself, it is consubstantial with it. ... Value is everywhere and nowhere ..., simply *lived* as the concrete meaning of that lack which makes my present being" (*B.N.*, 94-95). Could we not see here an implicit admission that value is *my essence* in the sense of a being which is capable of achievement by the exercise of freedom? Sartre would not consent to this: "The initial project of being God, which ^{*} defines 'man', comes close to being the same as human ^{*}nature' or an 'essence'" (*B.N.*, 566). But no; this project is not human essence, it is simply the meaning of human choices which are always particular. However, isn't this only bringing the concept nature from the abstract plane of man in se to the concrete plane of this man here? This may be a constrained avowal we get

from Sartre, but it shows how difficult it is to get away from essence and substance.

Now, either value has only one source, freedom, and then it is destroyed in indifference; or it supposes my freedom. If so, then my freedom rises from a lack of being which exists whether perceived or not, a lack which separates what I am now from my essence completely realized in both an ideal and real perspective. Thus, value rests on a true absolute : my essence such as God thinks it and wills it, such as my consciousness lives it and discovers it bit by bit. This essence that I am actually shows itself as an absolute only under two conditions : that I attach it to my immortal existence, and that I see it emanating from a creative and provident God. Sartre has denied substantial essence, immortality, and God. Upon what can he establish a firm basis for values?

c. *Being for others* appears to Sartre as being in irreducible conflict with the for-itself. Is this not fatal, since the latter is defined as pure freedom, a completely individual spontaneity?

We here rediscover the excesses of La Rochefoucauld and Rousseau : man is completely egoistic. The perfect man is the asocial man.

We can certainly recognize the truth of Sartre's descriptions of this conflict, but we must also remark in them a unilateral and falsified character. Sartre works here with a "choice" between egoistic feelings and altruistic attitudes, and he gives an overwhelming preponderance to the first. Is this the result of a completely experimental study? Are the phenomena of consciousness truly reduced to this "I have said it and that is enough?" No, for we must see here a completely different method at work, a deduction from an *a priori* idea, a deduction from a theory : it is that which defines the for-itself as a completely spontaneous freedom, as a project which suffices unto itself, in short, a project to make itself God.

Gabriel Marcel, on the contrary, has been able to describe a look, which can be experienced, which calls and offers itself with a generosity which does not precisely indicate that "preference towards appropriation by destruction" that Sartre sees

there (*B.N.*, 594); a look of admiration which rises towards the other, stimulating personal freedom and not smothering it as does envy; a creative look which stirs up the effort of others towards the good and the true, e.g., the look of a leader, a teacher, the look of mothers and fathers. Even a hostile look does not inevitably create conflict. Could it not invite me to develop my personal value to the point of "gaining" a true friend in him who was my enemy?

Individualism will not succeed in putting out this light which is in the heart of man. The other is indispensable for the development of the person. This light becomes a tendency and finally the law of free will: love thy neighbor as thyself. The for-itself, if it is truly this fundamental project of making itself the in-itself-for-itself, by exceeding itself indefinitely, can not fail to wish to advance itself through a society where the differing for-itselfs communicate their own riches by abolishing the impermeability of their individual frontiers, so that my for-itself is made available to all, while the for-itself of others is opened to fill my own needs.

5. Is there any appreciable *positive gain* in the work of Sartre? Here are some suggestions.

a. This work, by its structure and success, reveals certain aspects of our current generation: an acute curiosity about the why of human existence (*existentialism*); the rejection of anything beyond experience, such as the immortality of the soul and the existence of God (*phenomenalism*): a reclaiming of freedom in every sense of the word, and, in particular, a violent hostility against every check on pure spontaneity, against moral law, social exigencies, and esthetic or religious traditions (*individualism*).

b. Sartre's philosophy appears to be a strongly probable proof of the impotence of phenomenism to explain man and a kind of argument "ad absurdum" *in favor of substance* and cause, of substances *and a Creator*.

We must, however, be more precise. We can understand essence and substance in such a sense that man, who is explained in these terms, becomes monstrous and unrecognizable. It is

sufficient only to think of that *inert* and passive extension, in which Descartes believed he saw the essence of the body, or of that *immutable* ego, which Hume thought must be encountered in order to have the right to affirm human substance.

Sartre has rightly observed: "It is necessary that the permanent (in becoming, that is), should be that which changes." Yet it is precisely because there is something there that changes, that this something is substance: the essence of a being is really identical with its nature, i.e., it is the principle of its own modifications. Now, in not a few passages of Sartre, the freedom claimed as the very being of the for-itself is no other than that spontaneity designated by the terms essence and nature. So that an exegesis — which might often be labored — would arrive at the recognition of a part of the traditional philosophy, clad in the current style, even though that part be purely descriptive. Nevertheless, that part occupies a big place in being and nothingness.

But the phenomenological method has no way of going beyond phenomena. To do this there must be metaphysical principles, which are put "between parentheses" by this method. Hence, the problems posed at the heart of the existent, and a method offering nothing to resolve them, can present only a skeptical solution at first. Discouraged and discouraging, this solution is irreconcilable with freedom, which is not free to be freedom, and which chooses without having the power to abstain from choosing. There remains then a solution which builds the world, possibles, values and human destiny completely on freedom alone. This is Sartre's solution, and it forces man to assert the absurdity of his own existence, the impossibility of giving a free foundation to his liberty, the impossibility of being God.

It remains then to turn to another method, to think metaphysically, to make at least an hypothesis of a being for-itself which is not yet experienced, and to search in experience for the traces of its obscure germination.⁷ⁱ

⁷ⁱ E. Rideau, *Paganisme ou Christianisme*, has several pages on the work of Sartre, which are at the same time both lucid and charitable, pp. 113-123.

Man, then, is discovered as a substance, changing and perfectible through the operation of his free will. In the sight of his Creator he knows himself to be responsible for the fulfillment of his own being and that of others. If you wish, he is polarized by the fundamental project of making himself in-itself-for-itself, i.e., God. Thus would St. Thomas, perhaps, '• today express his idea of the natural desire to see the divine essence, which haunts the heart of man. To see the divine essence is also to be united to it by love and to all the others who are similarity united to it. However, St. Thomas would add, which is absolutely imposed, that this desire remains inefficacious as long as human liberty is not raised higher by the gratuitous gift of grace granted to man by the intervention of the Incarnate Word.

The *concrete* problem of human existence has a real solution only in the Catholic Faith.

* We can only say perhaps, for, if St. Thomas asserts that there exists in human intelligence, as in every created spirit, a desire which is natural but inefficacious to see the divine essence, yet he never considered such a desire as being able to define the nature of man.

Could such a desire to see God be used to define *created intelligence, in general*, i.e., to define it by its deepest aptitude? For more on this Question, see G. de Broglie, *Pour une Théorie Rationnelle de l'Acte de soi*, p. 29.

Assuredly the project of making one's self an in-itself-for-itself would be characteristic of Lucifer's freedom, expressed in his "*Non serviam*." In an opposite sense, it could also characterize the sure Christian hope for divine grace. But it does not express the very *nature* of man.

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• This bibliography makes no pretension of being an exhaustive one in either the fields of Cosmology or Philosophical Psychology. It has been compiled with the idea of being helpful to those who are teaching or studying this course as it is exposed by A. Munier. The French original of this work contained no bibliography, as such, outside the references in the footnotes. This bibliography incorporates into it many of the French works cited in the original text. Wherever it has been possible to replace a cited French work with an English translation or some equivalent English work, this has been done. Other English works, which were deemed useful in following the author's exposition, have been included. A number of useful paperbacks are also included in this listing, so that students lacking a background in theoretical science may have at hand a list of easily available reading. — The Translator.

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